

Recreational Hunting
Decision Document Package
for
Waccamaw NWR

Contents

1. Recreational Hunting Plan
2. Environmental Assessment
3. FONSI
4. Compatibility Determination
5. Intra-service Section 7 Biological Evaluation
6. Outreach Plan

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WACCAMAW NWR

Contents


1. Hunting Plan

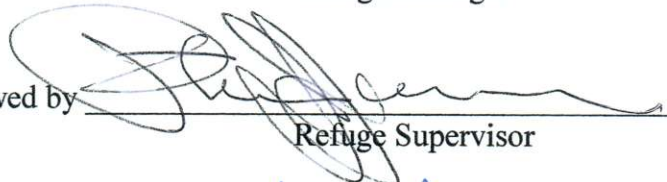
RECREATIONAL HUNTING PLAN

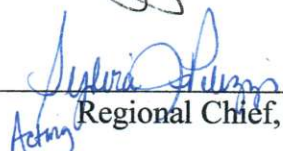
UNITED STATES FISH AND WILDLIFE SERVICE

WACCAMAW NATIONAL WILDLIFE REFUGE

JANUARY 2012

Recommended by  Date: 1/26/2012
Refuge Manager

Reviewed by  Date: 02/22/2012
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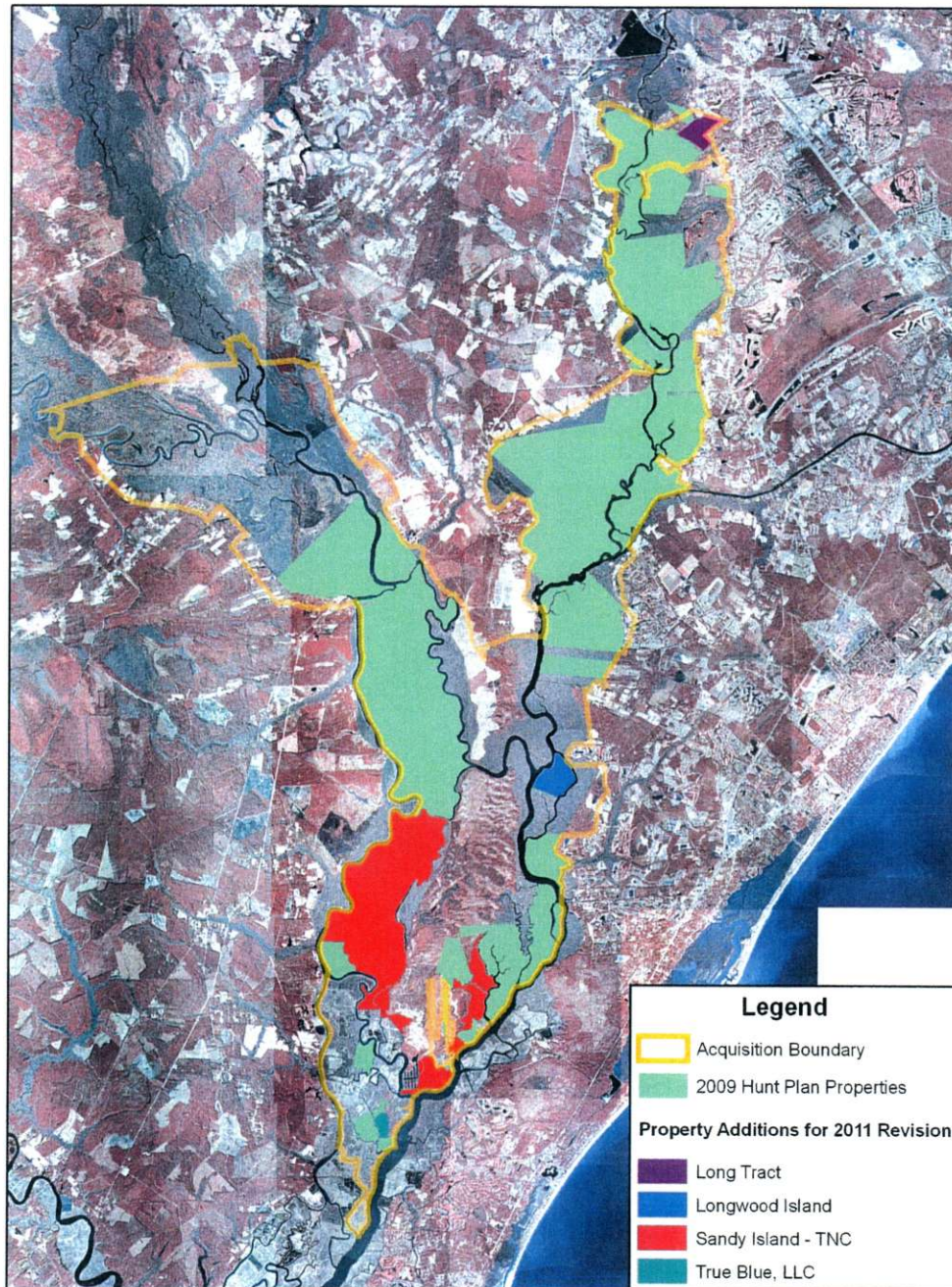
Concurrence by  Date: 3/8/2012
Regional Chief, NWRS

Approved by:  Date: 3/8/12
Regional Director

Table of Contents

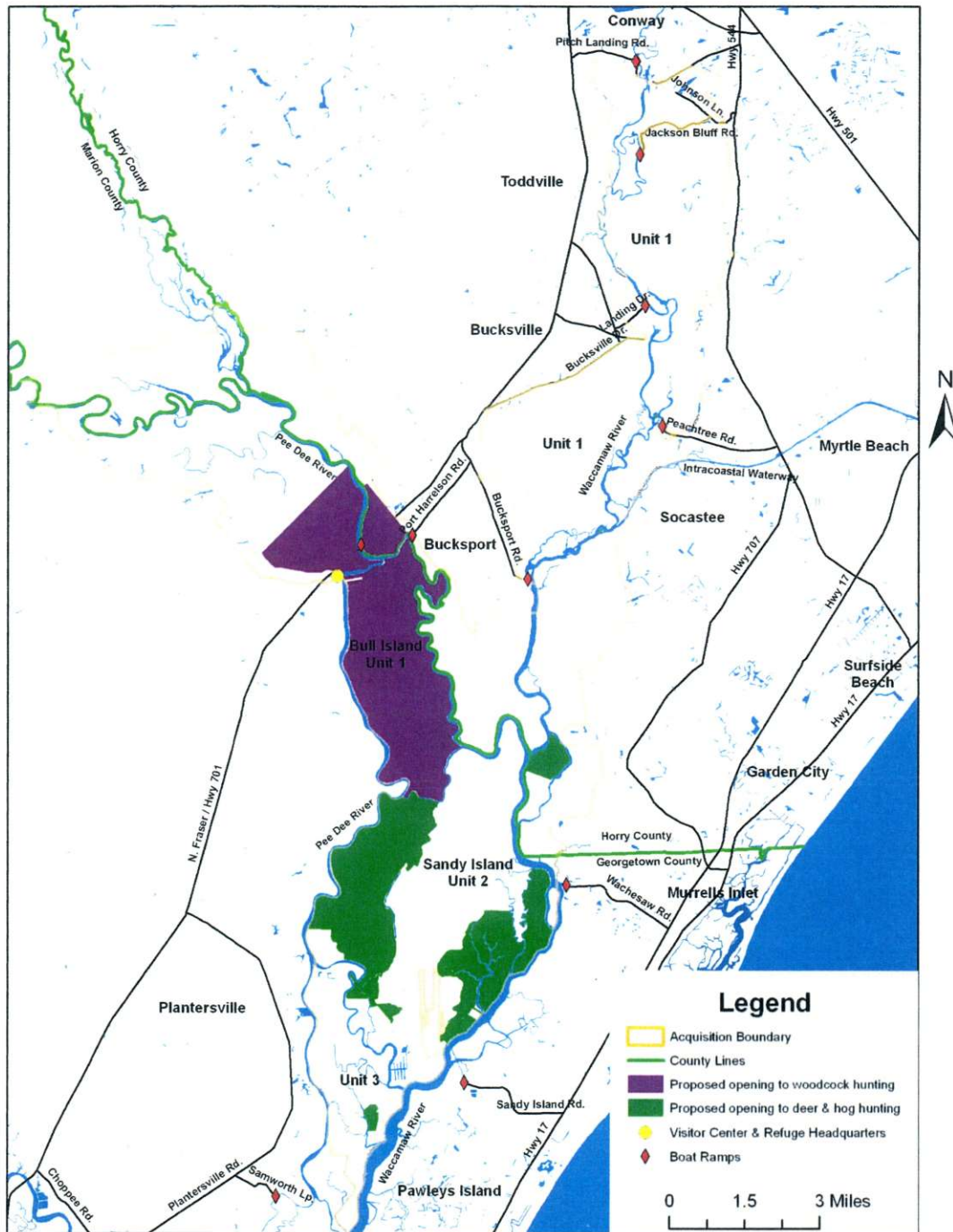
MAPS.....	1
I. INTRODUCTION.....	3
II. CONFORMANCE WITH STATUTORY AUTHORITIES.....	4
III. STATEMENT OF OBJECTIVES	5
IV. ASSESSMENT.....	6
V. DESCRIPTION OF HUNTING PROGRAM.....	12
VI. MEASURES TAKEN TO AVOID CONFLICTS WITH OTHER MANAGEMENT OBJECTIVES	13
VII. CONDUCT OF THE HUNTING PROGRAM.....	14

**Newly Acquired or Leased Refuge Tracts Since 2009
Waccamaw NWR Recreational Hunting Management Plan**





Waccamaw National Wildlife Refuge Proposed Hunted Species Additions



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I. INTRODUCTION

Waccamaw National Wildlife Refuge (Refuge) was established in December, 1997 to provide and protect habitat for a natural diversity of wetland dependent wildlife associated with the Waccamaw and the Great and Little Pee Dee River floodplain basins. Located in portions of Horry, Georgetown, and Marion Counties, the Refuge's 54,522 acre acquisition boundary includes large sections of the Waccamaw and Great Pee Dee Rivers and a small section of the Little Pee Dee River.

The Refuge area was first identified in the early 1980s as containing a critically important migratory bird habitat that should be preserved. It was included in the U.S. Fish and Wildlife Service's (USFWS) Atlantic -Eastern Gulf Coast Migratory Bird Preservation Plan (USFWS 1982) and the Preservation of Black Duck Wintering Habitat Plan (USFWS 1985). In addition, the Refuge area was identified as one of the top priorities for protection in the Service's Southeast Regional Wetlands Concept Plan (USFWS 1992), which was prepared as part of the National Wetlands Priority Conservation Plan that was developed at the request of congress in the emergency Wetlands Resources Act of 1986. The Refuge area is also located in the heart of the Winyah Bay Focus Area (WBFA), an important conservation priority of the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan. The WBFA encompasses 525,000 acres in the lower drainage of the Black, Great and Little Pee Dee, Sampit, and Waccamaw Rivers and has gained national attention for the conservation partnerships which have afforded permanent protection on over 131,000 acres within the focus area boundary.

The wetland diversity of the Refuge is what sets it apart from most others found along the east coast. Wetland habitats range from historic tidal rice fields, to black-water and alluvial floodplain forested wetlands of the Waccamaw and Great Pee Dee Rivers. These tidal freshwater wetlands are some of the most diverse freshwater wetland systems found in North America and they offer many important habitats for migratory birds, fish, and resident wildlife. Avian species such as the swallow-tailed kite, osprey, white ibis, prothonotary warbler, and many species of waterfowl can be observed on a seasonal basis. Additionally, the diversity of these wetland habitats provides important habitats for numerous species of large and small mammals, reptiles, and fish species.

Three federally listed endangered wildlife species occur in the approved Refuge boundary and include the wood stork, red-cockaded woodpecker, and shortnose sturgeon. An Intra-Service Section 7 Biological Evaluation has been completed on this proposed hunt plan.

The Refuge's acquisition boundary is divided into three management units. Each unit is defined by a dominant habitat type and consequently requires unit-specific management goals and objectives. Unit 1 is approximately 39,574 acres and is made up entirely of alluvial and black-water floodplain forested wetlands. Unit 2 encompasses Sandy Island and totals 12,046 acres. Most of the acreage in this unit, 6,166 acres, is upland longleaf pine forest with the remaining acreage being made up primarily of tidal forested and emergent wetlands. Unit 3 is

approximately 2,902 acres and is made up of historic tidal rice fields, many of which remain intact and are managed today for wintering waterfowl.

The USFWS is actively acquiring lands within the acquisition boundary from willing sellers. Funding and authorization for Refuge land acquisition was provided primarily through the Land and the Water Conservation Fund Act of 1965 and more recently through Migratory Bird Conservation Commission funding. The Refuge currently owns or leases over 26,000 acres within the boundary.

II. CONFORMANCE WITH STATUTORY AUTHORITY

The federally legislated purposes for which the Refuge was established are “(1) protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of endangered and threatened species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and (2) provide compatible wildlife-dependent recreational activities including hunting, fishing, wildlife observation & photography, and environmental education & interpretation for the enjoyment of present and future generations. Establishing authorities include the Land and Water Conservation Fund Act of 1965, the Endangered Species Act of 1973, the Fish and Wildlife Act of 1956, the Refuge Recreation Act of 1962, the Emergency Wetlands Resources Act of 1986, the Migratory Bird Hunting and Conservation Stamp Act, and the Migratory Bird Conservation Act.

The Refuge Administration Act of 1962 (16 U.S.C. 460K) authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use when such uses do not interfere with the primary objectives for which the area was established. In addition, The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. In addition to the Refuge Administration Act, the Refuge Recreation Act and the National Wildlife Refuge System Improvement Act (Improvement Act) also provide the legal basis for holding public hunts on National Wildlife Refuges (NWR's).

This plan supports the priority public use provisions of the Improvement Act. Hunting, as specified in this plan, is a wildlife-dependent recreational use and the law states that as such, it “shall receive priority consideration in National Wildlife Refuge planning and management.” The Secretary of Interior may permit hunting on a refuge if he/she determines that such use is compatible with the refuge purpose for which it was established and the hunting program would not materially interfere with or detract from the fulfillment of the purposes of the refuge or mission of the National Wildlife Refuge System (603 FW).

Recreational hunting on the Refuge has been determined to be an appropriate public use which is compatible with the purpose for which the Refuge was established. This determination is based upon the thorough public analysis of Refuge purpose(s) during the Environmental Impact

Statement (EIS) process for the establishment of the Refuge (Waccamaw NWR Final Environmental Impact Statement (FEIS April 1997)). Furthermore, hunting was identified as a compatible public use by the Interim Compatibility Determination and the Conceptual Management Plan, both of which were incorporated into the Refuge FEIS.

In 2003, a Refuge hunt plan was developed in accordance with the National Environmental Policy Act (NEPA) which requires that an Environmental Assessment (EA) and Section 7 consultation are completed before completing a Compatibility Determination to open Refuge lands to a new public use. Since then, the hunt plan has been updated annually; however in 2007 the Refuge hunt plan and EA were expanded to include cumulative impacts of hunting throughout the National Wildlife Refuge System. Hunting was further evaluated in 2008 in the Refuge's Comprehensive Conservation Plan (CCP) which is a long-term comprehensive planning document that includes public comment and input throughout the planning process.

The CCP is an all-encompassing public process through which the Refuge examines past and present management plans and then determines top management priorities to set the course for future management decisions. Within this document, all existing and proposed public uses are evaluated by using the decision process directed by NEPA including completing an Intra-Service Section 7 Biological Evaluation, Wilderness Review, and a Finding of No Significant Impact (FONSI). In addition to NEPA guidance, the CCP also includes public use reviews which are required by the Improvement Act. The Refuge completed a Finding of Appropriateness of a Refuge Use and Compatibility Determinations on all public uses including hunting before final approval was given for all of the proposed Refuge uses. During the CCP process, numerous public comments were received in support of the Refuge acquiring more land as well as including hunting on newly acquired parcels. Furthermore, hunting was identified as one of the purposes for which the Refuge was established and it was first determined to be a compatible public use in the Interim Compatibility Determination (ICD) and in the Conceptual Management Plan (CMP).

Refuge hunts will be managed similar to South Carolina Department of Natural Resources (State) Wildlife Management Areas and Heritage Trust Preserves. Annual coordination meetings are held with the State to insure that all Refuge hunt regulations are in compliance with State statutes and authorities.

III. STATEMENT OF GOALS & OBJECTIVES

The purposes for which the Refuge was established as outlined in the CCP are to:

- Protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of indigenous species, anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and

- Provide compatible wildlife-dependent recreational activities including hunting, fishing, wildlife observation & photography, and environmental education & interpretation for the enjoyment of present and future generations.

Additionally, the Refuge has operated under the following management goals:

- Provide habitat for waterfowl, shorebirds, wading birds, raptors, neotropical migratory birds, and resident species;
- Provide opportunities for hunting, fishing, wildlife observation & photography, and environmental education & interpretation;
- Protect, restore, and enhance the biodiversity of aquatic resources, wetlands, and their associated habitats on a landscape scale;
- Protect, enhance, and manage migratory bird populations and the habitats upon which they depend;
- Manage National Wildlife Refuges to serve as models for effective conservation of natural resources; and
- Increase and enhance public awareness, support, and participation to carry out the Service's mission through cooperative outreach efforts.

IV. ASSESSMENT

A. Compatibility with Refuge Objectives

Recreational hunting as authorized by the federal regulations listed above will not interfere with the primary purpose for which the Refuge was established. This determination is based upon a thorough public analysis of Refuge purpose(s) during the FEIS process for the establishment of the Refuge published in April 1997.

Included within the FEIS, are the CMP and the ICD, both of which address the anticipated allowance of recreational hunting prior to the establishment of the Refuge. Within the CMP, it is stated that "Recreational hunting of waterfowl, small game, and white-tailed deer will be permitted within the framework of state and federal regulations and licensing requirements." The ICD describes ongoing wildlife-dependent recreational activities occurring on lands to be acquired as part of the proposed Refuge and determines if they are compatible with the purpose for which the proposed refuge will be established. One of four uses covered by the ICD is recreational hunting of big game, small game, and migratory and resident birds in accordance with State regulations.

The Refuge hunting program, as designated in the CCP, is a strategy for allowing hunting as a primary use of the Refuge in an effort to provide opportunities for quality, wildlife-dependent public uses, leading to greater understanding and enjoyment of fish, wildlife, and habitats contained within the WBFA. The program is a tool that the Refuge uses to fulfill several of its goals and objectives as outlined in the CCP including:

- Supporting national and regional plans and promoting management actions that will support viable populations of native fish and wildlife species associated with black water and alluvial forested wetlands with special emphasis on migratory birds, black bear, and threatened and endangered species
- Conserve, manage, and enhance natural diversity, abundance, and ecological functions of Refuge habitats in support of national and regional plans, with special emphasis on managing towards old growth bottomland forest habitats; and
- Providing opportunities for quality, wildlife-dependent public uses, leading to greater understanding and enjoyment of fish, wildlife, and habitats contained within the Winyah Bay Focus Area;

B. Biological Assessment

Hunted Wildlife

Migratory Game Birds

Waterfowl hunting has been a rich tradition in the Refuge area. The Refuge acquisition boundary lies in the heart of the WBFA and encompasses a rich diversity of waterfowl habitats from vast spans of forested wetlands to tidal emergent wetlands in the lower half of the Refuge acquisition boundary. These tidal emergent wetlands make up an extensive portion of once forested wetlands that were cleared in the 17th and 18th Century for rice production, and are now managed waterfowl habitats.

Waterfowl hunting occurs throughout the Refuge acquisition boundary along public thoroughfares that bisect private and public lands as well as a portion of bottomland alluvial forests in Unit 1. These areas are hydrologically dependent on natural annual flooding associated with the Great Pee Dee River and consequently may not offer suitable waterfowl hunting opportunities on a consistent basis. Due to this and other limiting factors, waterfowl hunting within the designated hunting area has been minimal. For this reason and due to the greater diversity of waterfowl located in Unit 2 and 3, hunters most often congregate around managed waterfowl habitats however even there hunter success is generally very low due to a high level of disturbance resulting from the high density of hunters. In recent years, the disturbance levels have reached such an intensity that it is being considered as one of the primary reasons that

wintering waterfowl numbers are declining in the WBFA. One of the primary objectives of the Refuge is to create and enhance waterfowl habitats on Refuge owned lands. The Refuge currently manages over 26,000 acres, many of which contain important migratory waterfowl habitats. Of the total Refuge acreage, 20,131 acres (76%) are closed to waterfowl hunting to provide adequate sanctuary for wintering waterfowl.

Snipe frequently occur in high enough concentrations on Refuge lands to provide moderate to high levels of hunting success. These seasonal concentrations only occur in the tidal emergent wetlands associated with Unit 3 and are most often associated with food availability as a result of soil disturbance by feral hogs. Hunting for snipe is allowed on the Refuge in tracts of tidal wetlands within Unit 3. Snipe hunting occurs after the close of waterfowl season and non toxic shot is required.

Woodcock frequent river bottom habitats throughout the Refuge boundary. The number of woodcock using these habitats is influenced by weather and flood events and population numbers are high enough to provide moderate to high levels of hunting success depending on access. Tracts along the Great Pee Dee River provide some of the best opportunities for walk-in access and these are the parcels being opened to woodcock hunting. As more land is acquired along the Great Pee Dee River, hunter access may be improved which may improve hunter success. Areas open to woodcock are currently the same as those open to waterfowl hunting and additional disturbance is not likely to increase by adding a woodcock hunt.

Big Game

White-tailed Deer

White-tailed Deer harvest is essential to maintain the herd at or below habitat carrying capacity on Refuge lands. Overpopulation leads to starvation, increased car-deer collisions, and poor overall herd health. Deer herd health checks are conducted every five years on the Refuge by the Southeast Cooperative Wildlife Disease Study (SCWDS) in Georgia. Based on the most recent deer population health evaluation conducted by SCWDS on July 25, 2005, any significant increase in the overall deer population density, would likely result in declines to population health due to density-dependent parasitism and malnutrition. In addition to poor herd health, deer overpopulation results in over browsing which can completely change the plant composition of a forest and consequently alter future regeneration.

White-tailed deer occur on all lands within the acquisition boundary, in moderate to high densities, depending on seasonal food availability and habitat conditions. These variables may differ within specific Refuge units and will be considered when adjusting annual hunting regulations. The entire Refuge acquisition boundary has been traditionally hunted in accordance with State regulations for private lands prior to either State or federal acquisition. Based on habitat and herd health assessments for Refuge managed lands, white-tailed deer populations are presently at elevated levels. Deer hunting will take place on Refuge lands where tracts are large

enough to allow safe, responsible hunting opportunities in accordance with State and Refuge regulations. Refuge specific regulations on white-tailed deer hunting may vary between units based on habitat and wildlife management needs listed above.

Feral Hogs

Feral hogs are an extremely invasive non-native species and are not considered a game animal by the South Carolina Department of Natural Resources. They also can harbor several infectious diseases, some of which can be fatal to native wildlife. By rooting and wallowing, feral hogs destroy wildlife habitat. Damage includes erosion along waterways and wetlands and the loss of native plants. Additionally, feral hogs compete directly for food with native species such as deer, bears, turkeys, squirrels and many other birds and mammals. They are predators of reptiles, small mammals including deer fawns, as well as ground-nesting birds such as turkey and quail.

Feral hogs are an increasing problem both on Refuge lands and adjoining privately owned lands. They occur in all three units of the acquisition boundary and their density is increasing annually. Hunting of feral hogs provides the Refuge with proven management tool in reducing this detrimental species, and at the same time, is widely enjoyed by local hunters. Special hunts may be allowed throughout the year as needed to control this species. Use of dogs to hunt hogs will be considered if other methods of hunting do not provide an adequate measure of control on hog populations.

Wild Turkey

Eastern wild turkey occurs throughout the Refuge acquisition boundary. Biologists with the State have been monitoring wild turkey populations throughout South Carolina and have actively restored populations in all historic ranges throughout the state. Based on data generated from mandatory hunter reporting and monitored successes of the overall restocking program, the local turkey population has withstood hunting on surrounding private lands for several years without a negative cumulative effect on turkey populations. In addition to this data, the Refuge has coordinated with the State to gather information on hunter success rates and impacts on local populations of turkeys associated with youth hunts that are permitted on State lands in similar habitat types. Based on this information, the Refuge should not adversely impact the population if lands are acquired which will provide an opportunity for turkey hunting and a turkey season is offered.

Small Game (Gray squirrel, Raccoon, Opossum)

Although no studies have been conducted on small game within the Refuge, studies have been conducted within and outside of South Carolina to determine the effects of hunting on the population dynamics of small game. Results have consistently shown that small game, such as raccoons and gray squirrels, are minimally affected by hunting but greatly affected by limited

food resources and diseases common to overpopulation. Due to the remote nature of the Refuge, physical access is limited which allows the small game species to thrive where adequate food sources are available to sustain the populations.

Non-hunted Wildlife

Black Bear

One of the Refuge's major objectives is to target Refuge acquisition and habitat restoration efforts within wetland corridors to improve connectivity between bear populations. There are two populations of the American black bear in South Carolina, one located in the mountainous region and the other in the northern coastal plain. The coastal population, conservatively estimated at 200-300 bears, occurs primarily in Georgetown and Horry counties. The population on the Refuge is unknown, but presently deemed to be relatively low. Black bears need large expanses of forest interspersed with early-successional areas which provide food and escape cover. Early-successional areas also furnish a backup source of food during poor mast-producing years. A minimum of 5,000 acres of such habitat is required before bear management practices may be of any benefit. The Refuge and surrounding wild lands more than meet this minimum requirement and protecting corridors between larger patches of habitat will be essential to conserving bear populations in fast-growing Georgetown and Horry counties. In an effort to conserve these migration corridors and genetic diversity & viability, bear hunting will not be permitted on the Refuge.

American Alligator

The American alligator occurs throughout wetland areas of the Refuge, though in comparatively low numbers with other areas of the county. Alligators are most common in managed wetlands in Unit 3 however they are seen in the rivers and creeks that run through the Refuge. Alligators play a significant ecological role within the Refuge because they are one of the primary apex predators found within the Refuge. Large alligators (over 6 feet in length) help control small and large mammal populations including raccoon and feral hogs. Additionally, older age alligators help reduce the overall alligator population by preying on smaller alligators. Alligator numbers within the Refuge that are in the older age class is relatively low and therefore alligator hunting on Refuge lands is prohibited.

Small Game not Hunted

Bobwhite quail, dove, mink, beaver, coyote, bobcat, muskrat, otter, skunk, weasel, rails, coot, gallinule, ruffed grouse, crow, fox squirrels, cottontail rabbits, and marsh rabbits do not occur in numbers to provide quality hunting opportunities on Refuge lands. If lands are acquired in the future that offer better opportunities, or if populations increase to a level where management is needed, then hunting will be considered unless it conflicts with other management strategies.

C. Economic Feasibility

Many of the annual hunt administration costs including salary, equipment, boundary signs, and maintenance, are also costs associated with other management activities that would be required whether hunting is permitted or not. The cost for hunt brochures, boundary signs, and law enforcement are the primary costs directly associated with hunting. In the case of law enforcement, annual costs are equal to or slightly reduced because constant patrols are no longer necessary as was required prior to opening the Refuge to hunting. One full-time employee (FTE) is expended in conducting hunt-related activities during the active hunting seasons. Annual appropriations for the Refuge are adequate to meet the goals and objectives of the hunting program and it is anticipated that future funding at current levels would continue to be sufficient to continue the current and proposed hunting program on the Refuge.

D. Relationship with other Refuge Programs

The proposed hunts are structured in such a way as to offer a quality hunting experience while achieving wildlife management goals and objectives. Big game, waterfowl, and small game hunts are alternated to avoid conflicts between the different hunting interest groups. Refuge areas that offer other public uses such as fishing, wildlife observation & photography, and environmental education & interpretation, are either closed to these uses during the hunts or are closed year round to hunting to avoid any conflicts between hunters and these other public use groups.

E. Recreational Opportunity

Allowing hunting on newly acquired Refuge lands will provide additional opportunities for wildlife-dependent recreation. Access is limited on most of the Refuge due to the nature of Refuge habitats. In an effort to increase public use, the Refuge has placed great emphasis on developing quality public recreation areas that are closed to hunting to better serve these special interest groups. For example, the Cox Ferry Lake Recreation Area (CFLRA), a 340-acre recreation area in the northeastern corner of the Refuge has been closed to hunting in an effort to provide year-round opportunities for fishing, wildlife observation & photography, and environmental education & interpretation. With the help of private and public grants, visitor enhancement facilities including a trail network, boardwalk, picnic shelters, overlooks, & kiosks have all been develop on the recreation area. Additionally, the Refuge recently acquired an additional 230 acres adjacent to the CFLRA which is also closed to hunting and will provide additional recreational opportunities.

V. DESCRIPTION OF HUNTING PROGRAM

A. General

Hunting in South Carolina is regulated by pertinent State regulations. All pertinent state laws and regulations contained in these codes also apply to the Refuge hunting program. Annual consultation with the State will continue prior to the finalizing of Refuge regulations to ensure that any changes are properly coordinated. In addition to State licensing requirements, Refuge hunt permits will be required for all hunts. These permits will be available free of charge and can be obtained through Refuge facilities or participating local distributors. Seasons and bag limits may be more restrictive but not more liberal than the seasons/limits set by the State.

B. Areas Open to Hunting

An area must be properly posted or depicted on the Refuge hunt brochure map and the boundary line clearly marked before it is open to hunting. At present, all posted areas will be open to hunting unless otherwise posted as a "Closed Area" or "No Hunting Zone". The Refuge is divided into three distinct hunting units. Unit 1 is primarily comprised of forested floodplain wetlands of the Great Pee Dee and Waccamaw Rivers. Unit 2 is Sandy Island and associated forested and/or diked and managed wetlands. Unit 3 primarily consists of a mix of tidal non-functional historic ricefields and functionally intact managed wetlands. Hunting seasons and regulations will be separate for each unit to allow for unit-specific wildlife management needs.

C. Species to be Hunted

Species addressed in this plan to be hunted include migratory birds (snipe, woodcock, & waterfowl), small game (gray squirrel, raccoon, & opossum), and big game (deer, & turkey). Feral hogs are not considered by the South Carolina Department of Natural Resources to be a game animal however they are also included in this group for combined hunting seasons. Refuge hunts vary by specific units and are set to allow for other management objectives to be met. All hunts will fall within the state season framework. Either-sex hunting will be allowed when the Refuge hunt overlaps a State designated either-sex day or by using State issued antlerless deer tags or a combination of the two. Feral hogs will be allowed to be taken during all Refuge deer hunts and during a special hog season in the spring. Legal weapons are limited to those permitted for the coinciding deer hunt. Enforcement of hunt regulations is primarily carried out by the full-time Refuge law enforcement officer, supplemented with assistance from one other Refuge officer when needed. Multiple access points throughout the Refuge makes the typical game check station impractical and therefore check-in will not be required.

VI. MEASURES TAKEN TO AVOID CONFLICTS WITH OTHER MANAGEMENT OBJECTIVES

A. Biological Conflicts

At present, no biological conflicts are anticipated with any of the types or methods of hunting described in this plan. However, special restrictions such as duration of a hunt or specific area limitations may be used to reduce or prohibit hunting within certain areas of the Refuge where a biological conflict is identified. One example of a potential biological conflict on National Wildlife Refuges is between late fall deer/hog hunting and management goals of a waterfowl management area. This situation is resolved by opening the deer/hog season prior to the arrival of migratory waterfowl. Another potential conflict is the disturbance to non-target species caused by the use of dogs for hunting purposes. Restrictions on the use of dogs will be adjusted to reduce wildlife disturbance while providing for the specific needs of the hunters.

B. Public Use Conflicts

The entire Refuge acquisition boundary has been traditionally used by both private property owners and the general public for a variety of uses, with recreational hunting and fishing being the two primary uses. Most of the lands within Unit 2 and 3 were converted from rice plantations to private waterfowl hunting clubs in the early to mid 1900s. Because of the general difficulty of physically accessing most of the Refuge area, these traditional uses continue to dominate the public use spectrum. Due to the relatively short time periods proposed for the hunts, any other public use conflicts will be of a temporary basis. Modifications to the hunting program may be necessary as other Refuge programs are developed.

Other types of public uses are expected to increase as the public learns more about the Refuge and what it has to offer, such as fishing, wildlife observation & photography, and environmental education & interpretation. These recreational types of activities should not overlap with hunting activities because areas open to hunting are temporarily closed to other public use groups during the hunts. Hunting is not allowed on Sundays so these areas continue to provide limited access during the Refuge hunts. Additionally, areas closed to all hunting, such as the CFLRA, will offer non-hunter user groups access to recreational sites year round. If conflicts arise, management strategies will be implemented to mitigate the problems.

C. Administrative Conflicts

Annual appropriations for the Refuge are adequate to meet the goals and objectives of the hunting program and it is anticipated that future funding at current levels would be sufficient to continue the current and proposed hunting program on the Refuge.

VII. CONDUCT OF THE HUNT

A. General Provisions and Access

The provisions listed below supplement the general regulations which govern the legal use of NWRs and their hunting programs as set forth in Title 50 of the Code of Federal Regulations.

Persons possessing, transporting, or carrying firearms on National Wildlife Refuges must comply with all provisions of state and local law. Persons may only use (discharge) firearms in accordance with NWR regulations (50 CFR part 27) and specific Refuge regulations (50 CFR part 32). Discharging firearms or weapons on a NWR is prohibited unless specifically authorized.

A Refuge general hunt permit is located on the front of the hunt brochure and it is required for all hunters. This permit along with state hunting licenses and photo identification must be carried at all times while hunting and is not valid until signed & dated by the hunter. By law, National Wildlife Refuges are closed to all recreational activities unless expressly permitted.

Only the hunts listed within the brochure are allowed on the Refuge unless a special hunt is authorized such as a special hog hunt. Hunting on the Refuge is only allowable in designated areas which are outlined in the hunt brochure map. When permitted, hunting, fishing, and other public uses will be in accordance with all applicable state regulations and the following special Refuge regulations unless otherwise listed.

Entry onto Refuge lands is done wholly and completely at the risk of the individual. Neither the landowner or the Refuge or the U.S. Fish & Wildlife Service accepts any responsibility for acts, omissions, activities, or conditions on these lands which cause or may cause personal injury or property damage.

Entry onto Refuge lands constitutes consent to an inspection and search of permits, licenses, hunting equipment, bag limits, vehicles, and their contents by USFWS, State, or local officers.

B. Refuge-specific Hunting Regulations:

Check In

No check-in is required.

Weapons

Discharging a weapon for a purpose other than to take legal game animals during established Refuge hunting seasons is prohibited. Discharging any firearm from a boat or vehicle is strictly prohibited (except hunting waterfowl). All firearms must be unloaded and dismantled (or cased)

while being transported in a vehicle or boat. Blow guns, and poison tipped arrows are prohibited. Only muzzleloading rifles using a single projectile are permitted during muzzleloader hunts.

Ammunition

Non-toxic shot is required when hunting with shotguns with the only exception being slugs. Buckshot is prohibited on all Refuge hunts and may not be in possession at any time while on the Refuge. Use of full metal jacketed bullets or rimfire ammunition during big game hunts is prohibited.

Refuge/Cultural and Historic Resources

All federally owned property including natural, historic, and archeological features are protected by Federal Law. Searching for or the removal of objects of antiquity or other historic value is strictly prohibited.

Season Dates & Bag Limits

Season dates and bag limits are set each year following a coordination meeting between the State and Refuge. Seasons and bag limits may be more restrictive but not more liberal than those set by the State.

Closed Areas and Times

Designated areas will be closed seasonally to hunting, fishing, and all other public access to provide resource protection and reduce migratory bird disturbance. Other areas may be closed for special management and safety reasons. The Refuge is closed everyday from one hour after sunset until one hour before sunrise except when allowances are made for specific Refuge hunts. Hunters may enter the Refuge no earlier than 5:00 am on hunt days and must leave the Refuge no later than 1 hour after legal sunset except during the State waterfowl season where waterfowl hunting is allowed on the Refuge (see waterfowl regulations.) Areas on the Refuge that are open to hunting will be closed to the general public during big game (deer, turkey and hog) hunts.

Intoxicants

While hunting on the Refuge, no person may consume or be under the influence of intoxicants, including alcohol or drugs. Possession of an open container of alcohol while hunting on the Refuge is prohibited.

Permits

A signed and dated Refuge hunting permit, along with proper State hunting licenses, & photo identification (such as a state issued driver's license) are required for all hunts. All permits and licenses must be in the hunter's possession at all times while hunting on the Refuge.

Baiting

Baiting and/or hunting in the vicinity of bait are prohibited. Baiting includes, but is not limited to, the distribution of grains, feeds, salts, mineral blocks, meats, fruits, & other consumable items.

Dogs

Dogs may be used for waterfowl, woodcock, snipe, raccoon, squirrel, and during special hog hunts. Dogs must be leashed and under control of the owner when not in pursuit of authorized game animals. All dogs are required to wear a collar displaying the owner's name, address, and phone number.

Vehicles

Only legally licensed vehicles are allowed on the Refuge. Vehicles are allowed only on established roads marked open. All other roads may be traveled on foot or by bicycle. The speed limit on all Refuge roads is 15 MPH unless otherwise posted. Vehicles may not block access gates and must be parked off of the road. Use of ATVs and airboats to access Refuge lands is prohibited.

Youth Hunting & Hunter Education

A youth hunter is defined as a hunter under the age of 16. All youth hunters must be accompanied by an adult (21 years or older) who has a valid State hunting license, a Refuge hunt permit, and any applicable stamps in their possession while hunting. Youth hunters are not required to have a State hunting license but must possess a Refuge hunting permit. Sight and voice contact must be maintained at all times. During any Refuge big game hunt an adult may only supervise one youth. Youth hunters participating in a big game hunt on the Refuge who are not sitting in the same stand as the supervising adult, must show proof of successfully completing a State approved hunter education program and must carry it with them at all times along with the Refuge hunting permit. During small game hunts, each adult may supervise a maximum of two youths. Youth hunters are not required to show proof of a State approved hunter education program for small game hunts but must carry a signed Refuge hunt permit with them at all times.

Hunting Stands

Deer and feral hogs must be hunted from elevated stands. Boats are not considered elevated hunting stands and shooting game (except waterfowl) from a boat is prohibited. Only one portable stand per hunter is permitted and must be clearly marked with the hunter's full name and phone number. Placing deer stands on the Refuge more than 3 days prior to the opening day of a specific hunt is prohibited. All hunting stands must be removed from the Refuge no later than 3 days after the Refuge deer or hog hunts. The use of nails, screws, or bolts to attach a hunting stand to a tree or hunting from a tree where a metal object has been driven to support a hunter is prohibited. Living trees or plants may not be trimmed, cut down, or

damaged in any manner. Any stands found within designated hunt areas outside of allowed season will be confiscated.

Tree Marking

Flagging may be used to mark entry sites from roads or trails and again at the stand site. You may use clothes pins with reflective tape between these sites to mark the route to the stand. Hunters must label all such markers with their full name and remove them at the end of the hunt.

Man-Driving

Deer and hog hunting by “man-driving” are prohibited. A man-drive is defined as an organized hunting technique including two or more hunters where an attempt is made to drive game animals from cover to shoot, kill, or move animals towards other hunters.

Prehunt Scouting

Scouting is allowed all year during daylight hours except during the State waterfowl season. During the waterfowl season, scouting is allowed Monday through Friday only. The possession of firearms on the Refuge outside of designated hunting seasons is subject to regulations outlined in 50 CFR part 27. Game/Trail cameras & other scouting devices are prohibited.

Hunter Orange

Hunters must wear a hat, coat or vest of solid visible fluorescent orange during all big game hunts (deer/hog) except for wild turkey if a youth turkey hunt is added. Additionally, hunter orange must be worn during snipe and woodcock hunts and hog hunts.

Other Requirements:

All regulations listed in Title 50 of the Code of Federal Regulations.

Prohibited Activities

- Hunting from permanent blinds. Also, portable blinds and decoys must be removed at the end of each day's hunt.
- Camping, overnight parking, open fires, and littering.
- Using illuminating devices for the purpose of spotlighting deer.
- Game/trail cameras & scouting devices are prohibited on Refuge property.
- Hunting for wildlife on any Refuge unit other than that which is officially opened and posted.
- Entering or discharging a weapon within, into, or across a “No Hunting Zone” or “Closed Area”.

- Hunting on Sunday.
- Hunting or shooting any game (except waterfowl) from a boat.
- Hunting from within 100 feet of any roadway, whether open or closed to vehicular traffic or from within 300 yards of any residence or designated hunter check station is prohibited.
- Destroying or cutting vegetation. The possession of axes, saws, machetes, or other tools used for cutting vegetation are not permitted on the Refuge.
- Vehicles are restricted to designated public use roads. ATVs are prohibited.
- Man-drives, stalk hunting, dog drives, & hunting near artificially pruned trees.

C. Anticipated Public Reaction to the Hunt

The public has generally supported the Refuge hunting program with continued requests for more hunting opportunities, more access, and longer seasons. The Refuge is located in a mostly rural area and has a long standing tradition of being hunted while it was in private ownership. Public reaction from surrounding communities to all Refuge hunts has been very favorable and should continue to be the same in the future. Nationally, there are some anti-hunting sentiments, and many organizations are opposed to hunting on National Wildlife Refuges. It is possible that some objections may be voiced to some or all of the hunts within this plan. Additionally, different forms of other recreational uses will likely increase over time as the Refuge becomes more popular and some conflicts may arise between these groups. If these conflicts become a problem, management strategies will be implemented to mitigate these conflicts.

D. Hunter Application Procedures

Hunter application procedures are currently not implemented for any Refuge hunt. In the future, if an application procedure is used for any Refuge hunts, application forms approved by OMB will be used.

E. Hunter Selection Process

At this time, there is no hunter selection process for Refuge hunts. Permits will be issued free of charge to all who request one and are available at the Refuge Visitor Center or participating local distributors. The total number of permits distributed annually will not be restricted unless total hunter numbers create issues that significantly impact Refuge habitats negatively, or new areas are entered into the hunting program that may require tighter control of hunter numbers.

F. Media Selection for Announcing and Publicizing the Hunt

The Refuge maintains a contact list of local media outlets including newspapers, radio stations, & television stations. News releases will be developed announcing the hunting season dates, where hunt permits can be obtained, and other pertinent information and will be sent to each of the contacts on the list. Information will also be posted on the Refuge's website and Facebook page.

G. Description of Hunter Orientation

No specific effort is made toward hunter orientation other than previously mentioned media coverage, brochures, and personal contacts. Pre-hunt scouting is allowed since other forms of recreation are allowed in these areas.



A larger version of this map is available upon request from our Visitor Center.

Welcome to Waccamaw National Wildlife Refuge
Waccamaw National Wildlife Refuge is one of 553 National Wildlife Refuges in the U.S. and its territories. The mission of the National Wildlife Refuge system is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources, and their habitats within the U.S. for the benefit of present and future generations of Americans. Hunting is one of the many necessary tools used to responsibly manage wildlife populations. Maintaining a balanced population by removing surplus animals ensures the overall health and viability of all wildlife populations that depend on the managed habitats that this Refuge provides.

General Provisions and Access

The provisions listed below supplement the general regulations which govern the legal use of NWRs and their hunting programs as set forth in Title 50, Code of Federal Regulations.

Persons possessing, transporting, or carrying firearms on National Wildlife Refuges must comply with all provisions of state and local law. Persons may only use (discharge) firearms in accordance with refuge regulations (50 CFR 27.42) and specific refuge regulations (50 CFR Part 32).

A Refuge general hunt permit is required for all hunters and is located on the front of this brochure. This permit along with state hunting licenses and photo identification must be carried at all times while hunting and is not valid until signed & dated by the hunter. By law, National Wildlife Refuges are closed to all recreational activities unless expressly permitted.

Only the hunts listed within this brochure are allowed on the Refuge. Hunting on the Refuge is only allowable in designated areas which are outlined in the attached map.

When permitted, hunting, fishing, and other public uses will be in accordance with applicable state regulations and the following special refuge regulations unless otherwise listed.

The following regulations apply to all types of hunting on the refuge.

Check In
No check-in is required.

Weapons

Persons possessing, transporting, or carrying firearms on National Wildlife Refuges must comply with all provisions of state and local law. Persons may only use (discharge) firearms in accordance with refuge regulations (50 CFR 27.42) and specific refuge regulations (50 CFR Part 32).

Discharging firearms or weapons on a National Wildlife Refuge is prohibited unless specifically authorized. Discharging a weapon for a purpose other than to take legal game animals during established Refuge hunting seasons is prohibited. Discharging any firearm from a boat or vehicle is strictly prohibited (except hunting waterfowl). All firearms must be unloaded and dismantled (or cased) while being transported in a vehicle or boat. Crossbows, blow guns, and poison tipped arrows are prohibited. Only muzzleloading rifles using a single projectile are permitted during muzzleloader hunts.

Ammunition

Non-toxic shot is required when hunting with shotguns with the only exception being slugs. **Buckshot is prohibited on all Refuge hunts and may not be in possession at any time while on the Refuge.** Use of full metal jacketed bullets or rimfire ammunition during big game hunts is prohibited.

Refuge/Cultural and Historic Resources

All federally owned property including natural, historic, and archeological features are protected by Federal Law. Searching for or the removal of objects of antiquity or other historic value is strictly prohibited.

Closed Areas and Times

Designated areas will be closed seasonally to hunting, fishing, and all other public access to provide resource protection and reduce migratory bird disturbance. Other areas may be closed for special management and safety reasons. **The Refuge is closed everyday from one hour after sunset until one hour before sunrise except when allowances are made for specific Refuge hunts.** Hunters may enter the Refuge no earlier than 5:00 am on hunt days and must leave the Refuge no later than 1 hour after legal sunset except during the state waterfowl season where waterfowl hunting is allowed on the Refuge (see waterfowl regulations). **Areas on the Refuge that are open to big game hunting will be closed to the general public during hunts.**

Intoxicants

While hunting on the Refuge, no person may possess, consume, or be under the influence of intoxicants, including alcohol or drugs.

Other regulations

Use of ATVs and aircraft to access Refuge lands is prohibited.

Hunting American Alligators during the state alligator season on any Refuge lands is prohibited.

Special Hunting Regulations

Permits

A signed and dated Waccamaw NWR Refuge Hunting Permit, along with proper state hunting license, & photo identification (such as a state driver's license) are required for all hunts. All permits and licenses must be in your possession at all times upon entering Refuge property.

Hunters using the Refuge are subject to inspections of permits, licenses, hunting equipment, bag limits, vehicles, and their contents by USFWS or SCDNR Officers.

Baiting

Baiting and/or hunting in the vicinity of bait are prohibited. Baiting includes, but is not limited to, the distribution of grains, feeds, salts, mineral blocks, meats, fruits, & other consumable items.

Dogs

Dogs may be used for duck, snipe, raccoon, squirrel, and during special hog hunts. Dogs must be leashed and under control of the owner when not in pursuit of authorized game animals. All dogs are required to wear a collar displaying the owner's name, address, and phone number.

Vehicles

Only legally licensed vehicles are allowed on the Refuge. Vehicles are allowed only on established roads marked open. All other roads may be traveled on foot or by bicycle. The speed limit on all Refuge roads is 15 MPH unless otherwise posted. Vehicles may not block access gates and must be parked off of the road. **ATVs are prohibited.**

Youth Hunting

A youth hunter is defined as a hunter under the age of 16. All youth hunters must be accompanied by an adult (21 years or older) who is validly licensed by the state, and holds a Refuge Hunt permit, and any applicable stamps. Sight and voice contact must be maintained at all times. During any Refuge big game hunt an adult may only supervise one youth. During small game hunts, each adult may supervise a maximum of two youths. Youth hunters are not required to purchase state hunting licenses but must possess a Refuge Hunting Permit.

Hunter Education

All persons born after Jun. 30, 1979, must successfully complete a hunter education course that is approved by SCDNR before a state hunting license can be obtained. Any youth hunter participating in a big game hunt on the Refuge and who is not sitting in the same stand as the supervising adult must show proof of successfully completing a state approved hunter education program and must carry it with them at all times while hunting or carrying/possessing firearms or weapons on the Refuge.

During any Refuge big game hunts (Deer, Hog), youth must be directly supervised (within sight and normal voice range) by an adult at least 21 years of age possessing a state hunting license, Refuge hunting permit, & photo identification. Each adult may only supervise **one** youth during big game hunts.

Hunting Stands

Deer and feral hogs must be hunted from elevated stands. Boats are not considered elevated hunting stands and **shooting game (except waterfowl) from a boat is prohibited.** Only one portable stand per hunter is permitted and must be clearly marked with the hunter's full name and phone number. Placing deer stands on the Refuge more than 3 days prior to the opening day of a specific hunt is prohibited. All hunting stands must be removed from the Refuge no later than 3 days after each Refuge big game hunt. The use of nails, screws, or bolts to attach a hunting stand to a tree or hunting from a tree where a metal object has been driven to support a hunter is prohibited. **Living trees or plants may not be trimmed, cut down, or damaged in any manner.** Any stands found within designated hunt areas outside of allowed periods will be confiscated.

Tree Marking

You may use flagging to mark entry sites from roads or trails and again at the stand site. You may use clothes pins with reflective tape between these sites to mark the route to the stand. Hunters must label all such markers with their full name and remove them at the end of the hunt.

Man-Driving

Deer and hog hunting by "man driving" are prohibited. A man drive is defined as an organized hunting technique including two or more hunters where an attempt is made to drive game animals from cover to shoot, kill, or move animals towards other hunters.

Prehunt Scouting

We allow scouting all year during daylight hours except during the State waterfowl season. **During the waterfowl season, we allow scouting Monday through Friday only.** The possession of firearms on the Refuge outside of designated hunting seasons is subject to regulations outlined in 50 CFR part 27. Game/Trail cameras & other scouting devices are prohibited.

Hunter Orange

Hunters must wear a hat, coat or vest of solid visible fluorescent orange during all big game hunts (deer, hog) except for wild turkey.

This sign delineates the refuge boundary. Entry is permitted only for authorized uses (hunting, fishing, sightseeing, etc.) in accordance with refuge regulations.



This area is closed to all entry. No hunting, fishing or sightseeing is permitted. No roads or trails are open to the public.



This area is closed to all hunting. Firearms and archery equipment are strictly prohibited (see map).



Recreational Hunting
Decision Document Package
for
WACCAMAW NWR

Contents

2. Environmental Assessment

Environmental Assessment

2012 Recreational Hunting Management Plan
on

WACCAMAW NATIONAL WILDLIFE REFUGE
Horry, Georgetown, & Marion Counties, South Carolina

For Further Information, Contact:
Refuge Manager
U. S. Fish and Wildlife Service
Waccamaw National Wildlife Refuge
P.O. Box 1439
Georgetown, SC 28440

Prepared by:
U. S. Department of Interior
United States Fish & Wildlife Service
Waccamaw National Wildlife Refuge
Georgetown, South Carolina
January 2012

Table of Contents

CHAPTER 1: PURPOSE AND NEED FOR ACTION	1
CHAPTER 2: ALTERNATIVES INCLUDING THE PROPOSED ACTION.....	7
CHAPTER 3: AFFECTED ENVIRONMENT.....	8
CHAPTER 4: ENVIRONMENTAL CONSEQUENCES.....	23
CHAPTER 5: LIST OF PREPARERS	41
CHAPTER 6: CONSULTATION AND COORDINATION WITH OTHERS	41
APPENDIX A: LITERATURE REFERENCES	42
APPENDIX B: RESPONSE TO PUBLIC COMMENTS.....	44

Chapter 1: Purpose and Need for Action

1.1 Background

Waccamaw National Wildlife Refuge (Refuge) was established in 1997 after the U.S. Fish and Wildlife Service completed an Environmental Impact Statement. Its establishing and acquisition authorities include the Fish and Wildlife Service Coordination Act of 1958 (16 USC 661-667-E), Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b)), and the Fish and Wildlife Act of 1956 (16 U.S.C. 742f (b)(1)). The stated purposes of the Refuge are to:

- Protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of threatened and endangered species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and
- Provide compatible wildlife-dependent recreational activities, including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation for present and future generations.

This Environmental Assessment (EA) was prepared using guidelines established under the National Environmental Policy Act (NEPA) of 1969. NEPA requires examination of the effects of proposed actions on the natural and human environment. This EA covers the hunting chapter, which is preceding the overall Visitor Services Plan for the Refuge. In the following sections, two alternatives are described for future hunting opportunities on the Refuge, the environmental consequences of each alternative, and the preferred management direction based on the environmental consequences and the ability to achieve the Refuge's purpose.

In October 2008, a Comprehensive Conservation Plan (CCP) for the Refuge, which involved an EA, was approved. The EA and CCP addressed future management of the Refuge, including visitor services.

1.2 Purpose

The purpose of this EA is to evaluate the opportunities and impacts that can be reasonably expected to occur if the Refuge opens newly acquired or leased tracts to hunting. This document addresses present and future impacts of the Refuge's hunting program in Horry, Marion, and Georgetown Counties, South Carolina.

1.3 Need for Action

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) provides authority for the U.S. Fish & Wildlife Service (USFWS) to manage the Refuge and its wildlife populations. In addition, this Improvement Act declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the National Wildlife Refuge System (NWRS) and that they are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation that are specifically named in the Improvement Act. It even goes further in directing managers to increase recreational opportunities including hunting on National Wildlife Refuges (NWR's) when compatible with the purposes for which the Refuge was established and the mission of the NWRS.

The Refuge completed its first CCP in October of 2008. The CCP is an all-encompassing public process through which the Refuge examines past and present management plans and then determines top management priorities to set the course for future management decisions. Within this document, all existing and proposed public uses are evaluated by using the decision process directed by NEPA including completing an Intra-Service Section 7 Biological Evaluation, Wilderness Review and a Finding of No Significant Impact. In addition to NEPA guidance, the CCP also includes public use reviews which are required by the Improvement Act. The Refuge has completed a Finding of Appropriateness of a Refuge Use and Compatibility Determinations on all public uses including hunting before final approval was given for all of the proposed Refuge uses. During the CCP process, numerous public comments were received in support of the Refuge opening hunting on newly acquired parcels and hunting has been identified as a means for meeting the purposes for which the Refuge was established. Public comments regarding hunting are included in Appendix B.

1.4 Decision Framework

The USFWS Regional Director for the Southeast Region (Region 4) will need to make two decisions based on this EA: (1) select an alternative and (2) determine if the selected alternative is a major Federal action significantly affecting the quality of the human environment, thus requiring preparation of an Environmental Impact Statement (EIS).

The following are the two alternatives that were developed. Alternative B is the preferred alternative recommended to the Regional Director. The 2012 Waccamaw NWR Recreational Hunting Management Plan (2012 Hunt Plan) was developed for implementation based on this recommendation.

1. Alternative A (No Action):

- Newly acquired or leased Refuge parcels will not be opened to hunting.

2. Alternative B (Proposed Action):

- Newly acquired or leased Refuge parcels will be open to limited hunting as prescribed in the 2012 Hunt Plan.

1.5 Authority, Legal Compliance, and Compatibility

The NWRS includes federal lands managed primarily to provide habitat for a diversity of fish, wildlife and plant species. NWR's are established under many different authorities and funding sources for a variety of purposes. The purposes for the Refuge are listed in Section 1.1.

In the past, the ability to open the Refuge to hunting was covered under the National Wildlife Refuge Administration Act, 16 U.S.C 688dd (a) (2). This Act was amended in 1997 with the Improvement Act. These Acts support past hunting activities on the Refuge and future hunting opportunities, as proposed in this document as follows:

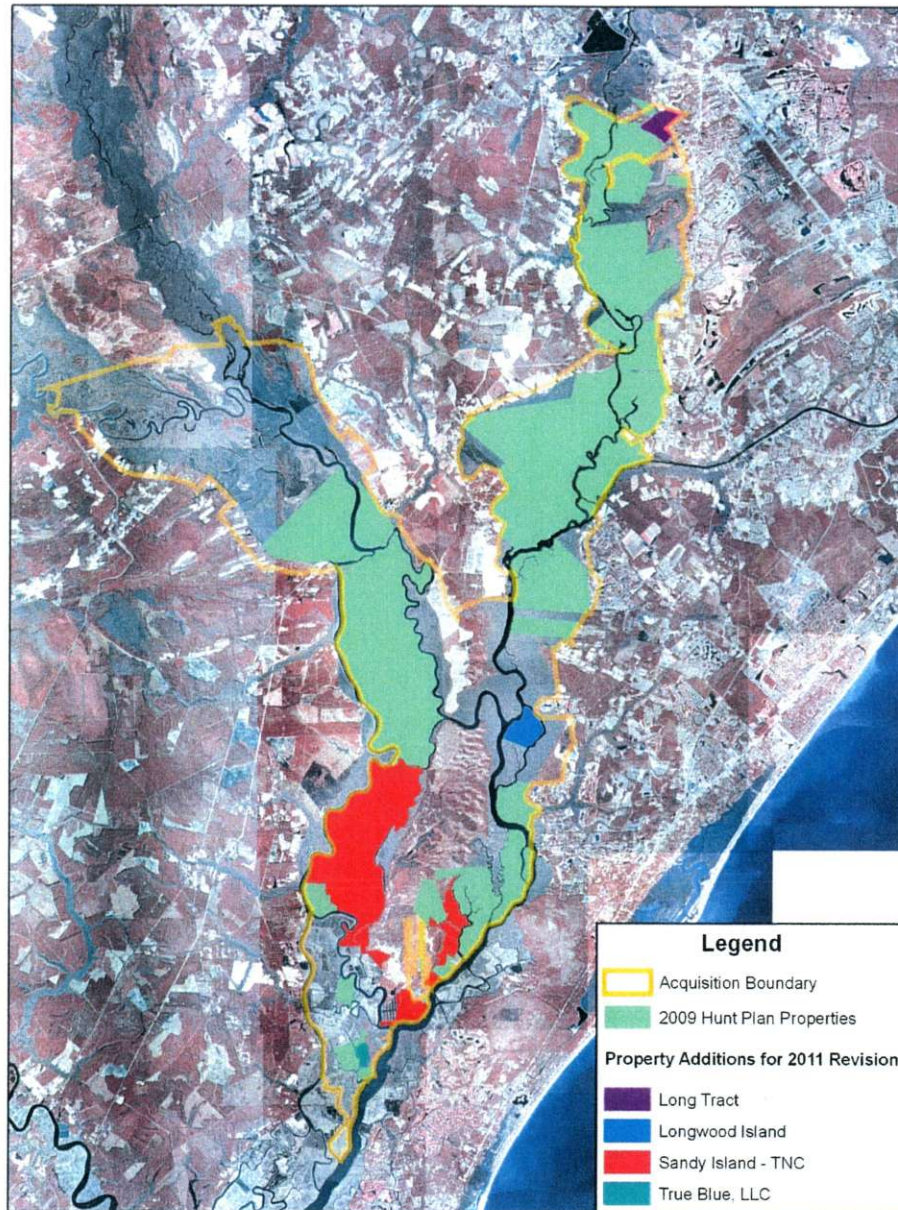
".... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans..." fl 16 U.S.C. § 668dd(a)(2) (National Wildlife Refuge System Administration Act)

"..... compatible, wildlife-dependant recreation is a legitimate and appropriate general public use of the System, directly related to the mission of the System and the purposes of many refuges...." Public Law 105-57, 111 STAT. 1254, Sec.5. (B) (National Wildlife Refuge Improvement Act of 1997).

The USFWS developed a strategic plan for implementing the Improvement Act. This plan clarifies the vision for the NWRS and outlines strategies for improving delivery of its mission. The 2012 Hunt Plan is compatible with the priorities and strategies outlined in the Improvement Act.

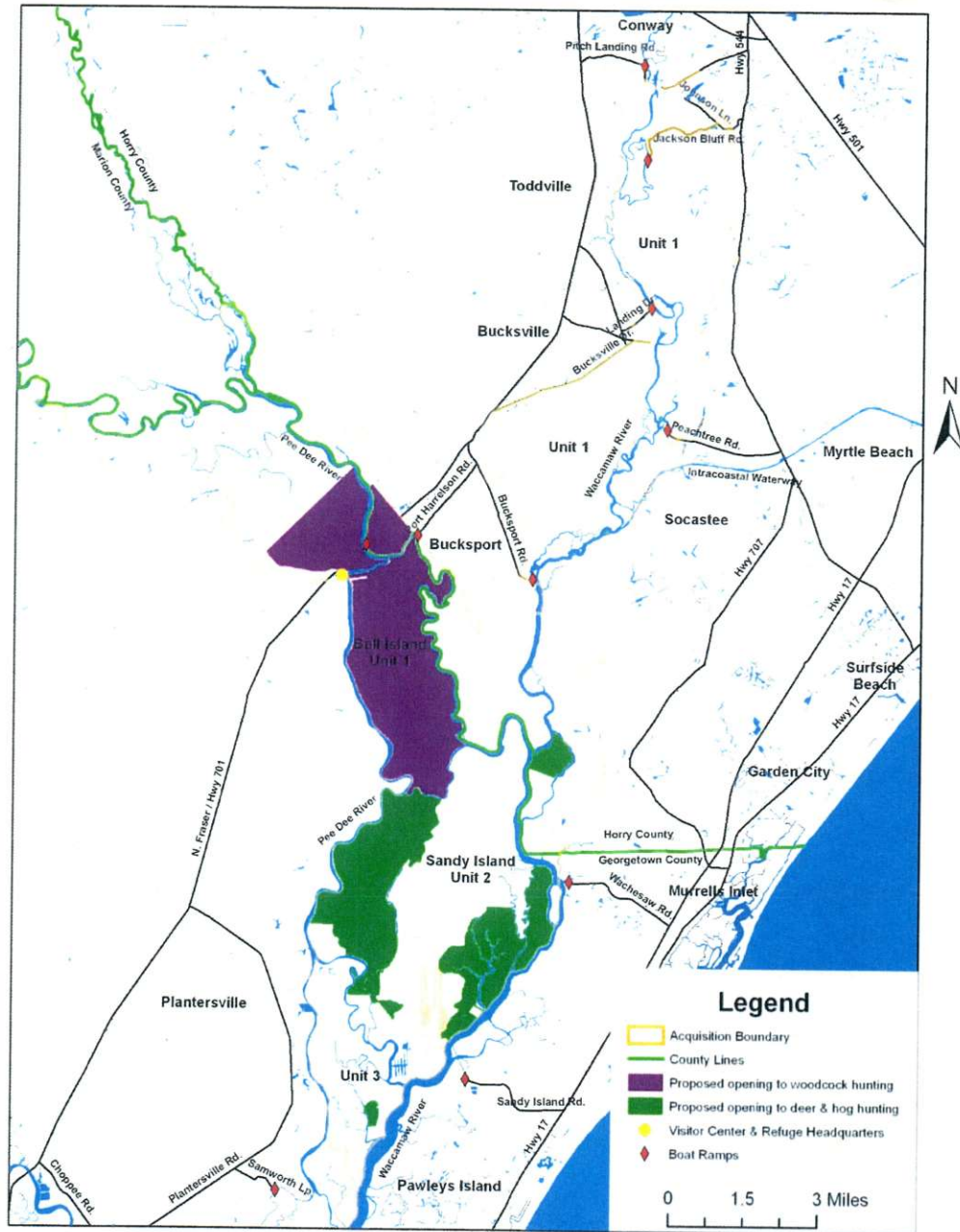
Additional authority delegated by Congress, federal regulations, executive orders, and several management plans, such as the 2008 CCP, guide the operation of the Refuge. The appendices of the CCP contain a list of the key laws, orders, and regulations that provide a framework for the proposed action.

Newly Acquired or Leased Refuge Tracts Since 2009
Waccamaw NWR Recreational Hunting Management Plan





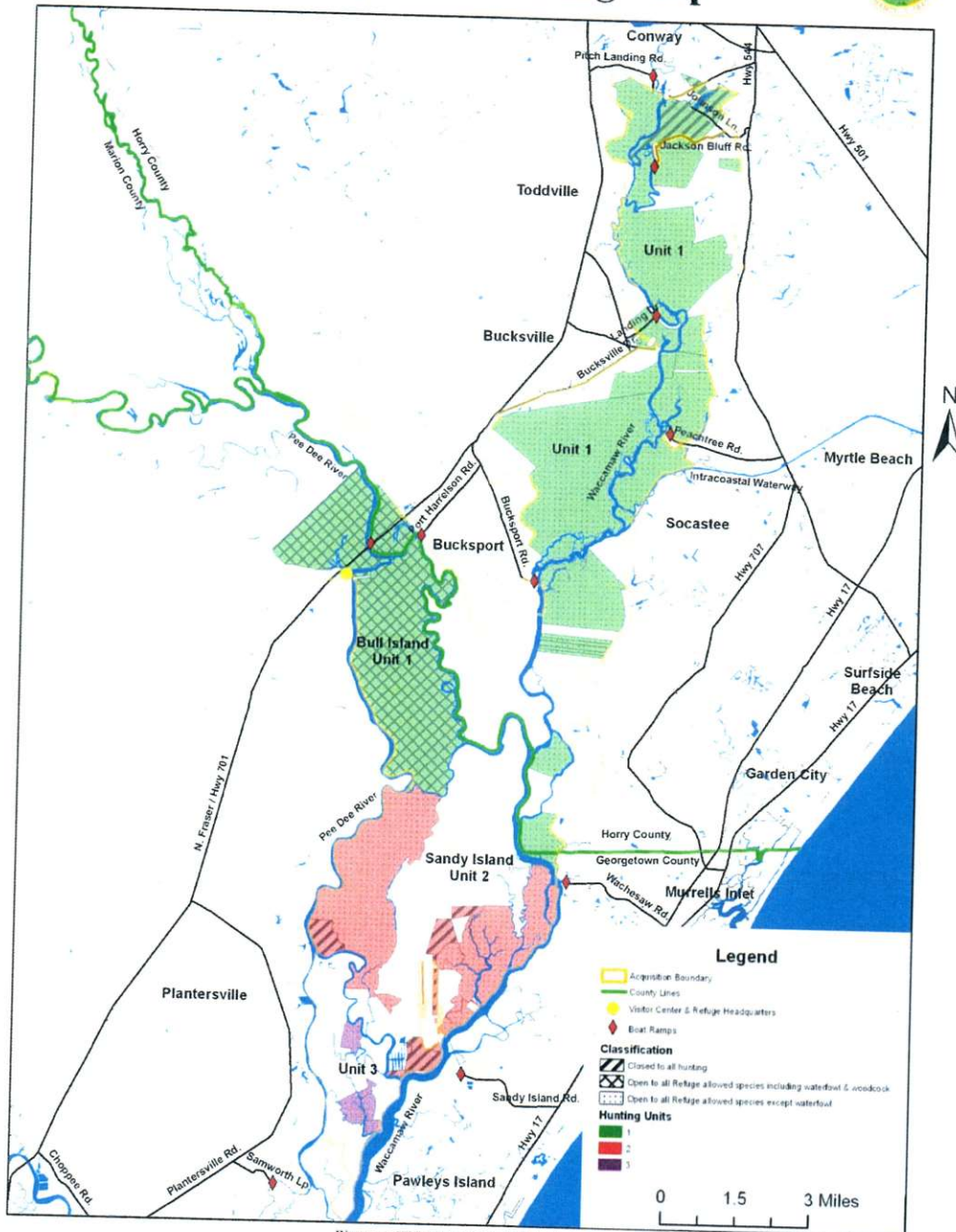
Waccamaw National Wildlife Refuge Proposed Hunted Species Additions



Waccamaw NWR Headquarters & Visitor Center
21424 N. Fraser St.
Georgetown, S.C. 29440
(843) 527-8069
www.fws.gov/waccamaw



Waccamaw National Wildlife Refuge Proposed Hunting Map



Waccamaw NWR Headquarters & Visitor Center
21424 N. Fraser St.
Georgetown, S.C. 29440
(843) 527-3069
www.fws.gov/waccamaw

Chapter 2: Alternatives Including the Proposed Action

This chapter discusses the alternatives considered for hunting on the Refuge. These alternatives are: 1) No Action, which continues with current management of the hunt program and 2) Proposed Action, which implements the 2012 Hunt Plan.

2.1 No Action Alternative: Current Management

Under this alternative, hunting would be limited to the lands currently open to hunting. There would be no change to current public use and wildlife management programs.

The Council on Environmental Quality's regulations for implementing NEPA requires all EA's to include the No Action alternative. This action would require that the Refuge post future Refuge parcels as "Closed to Hunting" as well as increase law enforcement patrols of these tracts to enforce closure regulations and provide adequate public information to ensure regulatory compliance.

All or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons.

2.2 Proposed Alternative: 2012 Waccamaw NWR Recreational Hunting Management Plan

The proposed action would allow the USFWS to open lands acquired in the future within the approved acquisition boundary to hunting.

All or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons.

The proposed action will allow limited public hunting on current and future Refuge lands.

The Refuge hunting season framework will be consistent with all South Carolina Department of Natural Resources (State) statutes within the applicable State Game Zones and further regulated by Refuge regulations according to USFWS policy. Refuge management goals and objectives may require occasional modifications to the hunting program as harvest data, public use pressure, and Refuge programs are developed. Use of quota hunt for special management purposes may be necessary to meet Refuge specific objectives.

Refer to 2012 Hunt Plan for specific regulations.

Chapter 3: Affected Environment

The Refuge was established in December 1997 to provide and protect habitats for a natural diversity of wetland-dependent wildlife associated with the Waccamaw and Great and Little Pee Dee River floodplain basins. Located in portions of Horry, Georgetown, and Marion Counties, the Refuge's acquisition boundary spans over 55,000 acres and includes large sections of the Waccamaw and Great Pee Dee Rivers, and a small section of the Little Pee Dee River. The Refuge area was first identified in the early 1980s as containing critically important migratory bird habitat that should be preserved. It was included in the USFWS's Atlantic-Eastern Gulf Coast Migratory Bird Preservation Plan (USFWS 1982) and the Preservation of Black Duck Wintering Habitat Plan (USFWS 1985a). In addition, the Refuge area was identified as one of the top priorities for protection in the USFWS's Southeast Regional Wetlands Concept Plan (USFWS 1992a), which was prepared as part of the National Wetlands Priority Conservation Plan that was developed at the request of congress in the emergency Wetlands Resources Act of 1986. The Refuge area is also located in heart of the Winyah Bay Focus Area (WBFA), an important conservation priority of the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan. The WBFA encompasses 525,000 acres in the lower drainage of the Black, Great and Little Pee Dee, Sampit, and Waccamaw Rivers and has gained national attention for the conservation partnerships which have afforded permanent protection on more than 131,000 acres within the focus area.

The wetland diversity of the Refuge is what sets it apart from most others found along the east coast. Wetland habitats range from historic, tidal ricefields, to black-water and alluvial floodplain forested wetlands of the Waccamaw and Great Pee Dee Rivers. These tidal freshwater wetlands are some of the most diverse freshwater wetland systems found in North America and they offer many important habitats for migratory birds, fish, and resident wildlife. Avian species such as the swallow-tailed kite, osprey, white ibis, prothonotary warbler, and many species of waterfowl can be observed on a seasonal basis. Additionally, the diversity of these wetland habitats provides important habitats for numerous species of large and small mammals, reptiles, and fish species.

The Refuge has scattered ownership of properties within the approved 54,522-acre acquisition boundary. Currently the Refuge manages over 26,000 acres within the boundary. Three management units are identified according to geographic and habitat types. Each unit is defined by a dominant habitat type and consequently may require unit-specific management goals and objectives. Unit 1 is approximately 39,574 acres and consists of alluvial and black-water floodplain forested wetlands. Unit 2 is 12,046 acres and consists of approximately 6,166 acres of upland longleaf pine forest, located on Sandy Island, and the remaining acreage consisting of primarily of tidal forested and emergent wetlands. Unit 3 is 2,902 acres and is made up of historic tidal ricefields many of which remain intact and are managed today for wintering waterfowl.

The U. S. Fish and Wildlife Service is actively acquiring lands within the acquisition boundary from willing sellers. Funding and authorization for Refuge land acquisition have been primarily provided through the Land and Water Conservation Fund Act of

1965 and more recently Duck Stamp Funding administered by the Migratory Bird Conservation Commission.

3.1 Physical Environment

Wetlands dominate the landscape of the Refuge acquisition boundary. Within the acquisition boundary, nearly 84 percent (45,798 acres) are wetland habitats, broken down as follows: managed wetlands, 629 acres; freshwater marsh, 2,923 acres; and wetland forest, 42,246 acres. The remaining lands (8,724 acres, or 16 percent of the acquisition boundary) are classified as upland forests.

Geographically, the Refuge is situated in a coastal zone within the primary floodplains of the Great Pee Dee and Waccamaw Rivers in Georgetown, Horry, and Marion Counties, South Carolina. The southern portion of the Refuge consists of emergent tidal wetlands. The central and northern portions are mostly hardwood-forested wetlands. Elevations range from near sea level to 76 feet above mean sea level, with the highest point located on Sandy Island in Georgetown County.

Three major rivers, the Waccamaw, Great Pee Dee, and Little Pee Dee, are the major sources of freshwater inflow to the Refuge acquisition boundary. The varied origins of these rivers and their different paths to the coast result in each having its own pattern of seasonal water flow and chemistry that interact with the physical and geological features of the landscape.

Two of the rivers, the Waccamaw and Little Pee Dee, are classified as black-water rivers. They are termed "black-water" because of the tea colored water, the result of tannins leached from vegetation within the extensive bottomland hardwood wetlands adjoining the rivers. Black-water rivers originate in the Coastal Plain, are typically acidic, low in suspended sediments, and support a diversity of native animal species. In contrast, alluvial rivers, like the Great Pee Dee, originate in the Piedmont and carry high sediment loads. Within the acquisition boundary, these rivers and their tributaries combine to form an incredibly diverse wetland landscape that supports many species of plant and animal life.

The Great Pee Dee River Basin originates in North Carolina and covers 2,350 square miles through its course in South Carolina, draining 7.6 percent of the state's land area (Beasley et al. 1988). Within South Carolina, the basin consists of five sub-basins or watersheds bounded by its principal rivers: the Black, Lynches, Great Pee Dee, Little Pee Dee, and Waccamaw. The Lynches River sub-basin traverses both the Piedmont and Atlantic Coastal Plain provinces; the Great Pee Dee River sub-basin is located almost entirely within the Atlantic Coastal Plain, with its northwestern tip extending into the North Carolina Piedmont; and the Waccamaw, Little Pee Dee, and Black River sub-basins lie entirely within the Atlantic Coastal Plain.

The Refuge acquisition boundary encompasses portions of the Great Pee Dee, Little Pee Dee, and Waccamaw River sub-basins. The Little Pee Dee flows into the Great Pee Dee

just inside the northern acquisition boundary; the Lynches River flows into the Great Pee Dee approximately 27 river miles above the northern Refuge acquisition boundary; and the Waccamaw River flows through the Refuge acquisition boundary. Flow data for the rivers within the boundary are not available; however, U.S. Geological Survey (USGS) discharge monitoring stations are located on each of the rivers upstream of the area.

USGS water discharge records are available for the Great Pee Dee River near the town of Pee Dee in Marion County; the Lynches River at Effingham in Florence County; the Little Pee Dee River at Galivants Ferry at the Marion-Horry County Line; and the Waccamaw River near Longs in Horry County (U.S. Geological Survey 1995). Approximate drainage areas, periods of record (POR), 1993 and 1994 annual mean flows, and POR annual mean flows for each of these stations are shown in Table 1 (all flow data are given in cubic feet per second--cfs).

Table 1. Water discharge rates for the Great Pee Dee, Lynches, Little Pee Dee, and Waccamaw Rivers.

River	Drainage Area (mi ²)*	Period of Record (POR)	1993/1994 Annual Mean Flows (cfs)	POR Annual Mean Flows (cfs)
Gr. Pee Dee	8,830	1938 – 1994	12,630/10,260	9,957
Lynches	1,030	1929 – 1994	1,183/888	1,044
Little Pee Dee	2,790	1942 – 1994	2,904/2,715	3,096
Waccamaw	1,110	1950 – 1994	1,225/664	1,191

*Includes drainage area located in North Carolina.

The flows of each river fluctuate considerably from month to month and year to year. However, long-term discharge records show consistent seasonal flow patterns for all of them. The lowest average flows typically occur from September through November, with the highest flows occurring from February through April. Overbank flooding is common during the high flow periods. The highest and lowest annual mean and monthly mean discharges of the Great Pee Dee, Lynches, Little Pee Dee, and Waccamaw Rivers (based on the periods of record from the recording stations given above) are shown in Table 2 (all values are given in cubic feet per second--cfs).

Table 2. Highest and lowest annual mean and monthly mean discharges of the Great Pee Dee, Lynches, Little Pee Dee, and Waccamaw Rivers.

River	Highest Annual Mean Flow (Year)	Lowest Annual Mean Flow (Year)	Highest Monthly Mean Flow (Month)	Lowest Monthly Mean Flow (Month)
Gr. Pee Dee	16,470 (1960)	5,392 (1981)	17,800 (March)	6,576 (Sept.)
Lynches	1,823 (1960)	451 (1934)	1,952 (March)	*597 (June)
Little Pee Dee	5,947 (1965)	1,371 (1951)	5,856 (March)	1,780 (Nov.)
Waccamaw	2,418 (1960)	439 (1952)	2,556 (March)	525 (Nov.)

*Not significantly different than the September, October, and November flows of 684 cfs, 685 cfs, and 689 cfs, respectively.

The water regimes throughout the Refuge acquisition boundary depend on a complex of closely integrated and dynamic variables. These variables include daily tidal fluctuations, as well as periodic flooding related to the seasonal high volume flows of the Great and Little Pee Dee and Waccamaw Rivers. Depending on the site, the mean high tides can fluctuate as much as two feet. The effects of seasonal flooding may be more or less dramatic. On the lower end of the Refuge acquisition boundary, a deltaic fan accommodates high volume flows; whereas the upper reaches of the floodplain are less extensive and experience prolonged flooding during high flows. These distinguishing features have separate ecologically significant functions that contribute to the diversity of wetland habitats on the Refuge. Other notable factors that influence the area's hydrology include varying states of dike disrepair, bed elevations, and channelization; varying stages of successional encroachment by aquatic plants; the presence or lack thereof of spoil disposal sites; past and present forestry and agricultural practices; alterations in runoff caused by man-made developments; and natural phenomena such as hurricanes, tropical storms, and heavy rains.

Climate within the Refuge acquisition boundary is influenced by the coastal waters of the Atlantic Ocean. In Georgetown, SC, the average winter temperature is 47 degrees Fahrenheit, with an average daily minimum of 38 degrees. In summer, the average temperature is 81 and the average daily maximum is 90 (National Climatic Center, Asheville, N.C., personal communication).

The total average annual precipitation is 53 inches. Of this, 60 percent usually falls in April through September, which includes the growing season for most crops. Thunderstorms occur on about 50 days each year, and most occur in summer.

Snowfall is rare. In 90 percent of the winters, there is no measurable snowfall. In 10 percent, the snowfall, usually of short duration, is little more than a trace. The heaviest 1-day snowfall on record in the area was more than 11 inches.

The average relative humidity in mid-afternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time in summer and 60 percent in winter. The prevailing wind is from the south-southwest. Average wind speed is highest, 10 miles per hour, in spring. The Refuge is subject to the effects of tropical storms and hurricanes from June through September.

3.2 Vegetation

The Refuge acquisition boundary is divided into three management units. Each unit is defined by a dominant habitat type and consequently may require unit-specific management goals and objectives. Unit 1 is approximately 34,800 acres and is made up entirely of alluvial and black water flood plain forested wetlands. Unit 2 is 9,144 acres and is made of approximately 6,166 acres of upland longleaf pine forest, located on Sandy Island, and the remaining acreage being made up primarily of tidal forested and emergent wetlands. Unit 3 is 10,055 acres and is made up of historic tidal rice fields many of which remain intact and are managed today for wintering waterfowl.

3.2.1 Open Water: This category includes all unvegetated freshwater bodies. Among these are bays, lakes, ponds, and rivers. Approximately 2,430 acres of open water occur in the Refuge acquisition boundary. Most of the open water is regulated by the State of South Carolina.

3.2.2 Freshwater Marsh: This category includes freshwater wetlands dominated by emergent vegetation. The majority of this habitat type is tidally influenced. Freshwater marshes remain flooded or saturated except during extremely dry weather cycles. Most of the freshwater marshes are criss-crossed with abandoned dikes and canals that were constructed for rice cultivation during the 18th and 19th Centuries. Plant diversity is greater here than within any other wetland habitat type in the Refuge area. Among the most common species are giant cutgrass, pickerelweed, sawgrass, jewelweed, water parsnip, yellow pond-lily, water hemlock, arrowhead, rose mallow, soft-stem bulrush, cattail, loosestrife, white water lily, and alligator weed. Woody vegetation, such as tag alder, bald-cypress, buttonbush, tupelo, and black gum may be interspersed on the old rice field levees. Approximately 2,923 acres of this habitat occur within the Refuge acquisition area.

3.2.3 Managed Wetlands: This category includes former rice field areas impounded by dikes or levees, where the hydrology is usually manipulated for the purpose of promoting plant species that are beneficial to waterfowl. The hydrological regimes are controlled by the impoundment managers. Most impoundments are managed for emergent vegetation including smartweed, fall panicum, wild millet(s), and Asiatic dayflower. Cultivated grains may be also planted during drawdown periods. Approximately 629 acres of managed wetlands occur within the southernmost portions of the Refuge acquisition

boundary.

3.2.4 Deciduous Forested Wetlands- Temporarily and Seasonally Flooded Tidal:

These areas remain flooded or saturated throughout most years except during extreme drought periods. Water depth may periodically fluctuate as a result of tidal influences. Plant community composition is relatively homogeneous. Dominant species include swamp tupelo, bald-cypress, green ash, water tupelo, and red maple. Approximately 25,077 acres of this habitat type occur in the Refuge acquisition boundary.

3.2.5 Deciduous Forested and Shrub Wetlands – Regularly Flooded Tidal: These areas remain flooded or saturated throughout most years. Water depths fluctuate daily with tides. Tree species composition is very similar to the immediately preceding habitat type. Shrub-dominated habitats within this habitat type include species such as swamp privet, buttonbush, and tag alder. The Refuge acquisition boundary contains approximately 5,780 acres of this habitat type.

3.2.6 Deciduous Forested and Shrub Wetlands – Temporarily Flooded or Saturated: These areas normally remain flooded or saturated throughout the winter and for brief periods during the spring. Diurnal tides have little or no influence on the hydrology of this wetland type. This habitat usually occurs at the higher elevations within the flood plain. Typical plant species include swamp chestnut oak, water oak, cherrybark oak, loblolly pine, several species of hickories, white oak, tulip poplar, ironwood, sycamore, and sweetgum. Only about 461 acres of this habitat type is present within the Refuge acquisition boundary.

3.2.7 Deciduous Forested and Shrub Wetlands – Seasonally and Semipermanently Flooded: These areas are flooded for very long periods during the growing season to almost continuously throughout the year. Diurnal tides have little or no influence on the hydrology of this wetland type. Typical species in the drier zones of this habitat range include diamond-leaf oak, green ash, American elm, and sweetgum. In wetter zones, overcup oak, water hickory, water tupelo, swamp tupelo, and bald-cypress predominate. Approximately 2,719 acres of this habitat type occur within the Refuge acquisition boundary.

3.2.8 Evergreen Forested and Shrub Wetlands: Most of these areas are rarely flooded but may be periodically saturated to the surface. This type usually occurs at the very highest elevations within the flood plain and on poorly drained flats and in depressions outside of the floodplain. Within the flood plain, these areas are at the driest end of the wetland spectrum and are vegetated by species such as loblolly pine, spruce pine, live oak, and American holly. Outside of the floodplain these areas are commonly called bay swamps, pine savannahs, or wet pine flatwoods and are vegetated by pond pine, loblolly bay, sweet bay, red bay, titi, fetter-bush, wax myrtle, zenobia, and sweet gallberry. The Refuge acquisition boundary contains approximately 1,167 acres of this habitat type.

3.2.9 Upland Forests: This category includes any area that does not meet the definition of wetland or deep-water habitat as classified by Cowardin et al. (1979). Approximately

6,166 acres of upland forest occur within the Refuge acquisition boundary. The majority of these uplands occur on Sandy Island. The natural plant communities of Sandy Island were described by Aulbach-Smith (1993). The upland plant communities on Sandy Island are highly diverse and include a maritime sandhill community, longleaf pine savannahs, and flatwoods with intermittent inclusions of small evergreen and deciduous depressions, pocosins, freshwater depression meadows, broad-leafed deciduous swamps, and pond pine woodlands. The maritime sandhill community on Sandy Island appears to be the only known site of this type in the state (WBFA Task Force Draft Plan 1994). The predominant vegetative community on Sandy Island is the longleaf pine/turkey oak type typically found within the Lakeland Fine Sand Ridges and covers approximately 3,000 acres. This is a natural pine stand that is developing into a mature forest community. Many of the longleaf pines are well in excess of 100 years old (WBFA Task Force Draft Plan 1994). Longleaf pine forests and savannahs, such as those on Sandy Island, were recently identified as a nationally critically endangered ecosystem (Noss et al. 1995). Of the 74 million acres that once existed, less than four million acres exist now in scattered remnants, and not many of these contain the entire components of the ecosystem (Frost 1993). Most of the other upland acreage within the Refuge acquisition boundary is pine forestlands under silvicultural management within Unit 1.

3.3 Wildlife Resources

3.3.1 Mammals: Temporarily flooded bottomland forests provide ideal habitat for many species of mammals. Food and cover are abundant and diverse, and a variety of mammalian species are present. About 40 species of mammals potentially inhabit the Refuge acquisition boundary. They include the largest omnivore native to South Carolina, the black bear, which is primarily associated with upland forests joined by extensive forested wetland corridors. On the smallest end of the mammalian size scale is the least shrew, which inhabits the marshes and open grass-covered areas. Seven species of bats may also be found throughout the watershed. Additionally, the acquisition area likely contains roosting and foraging habitat for at least two rare bats: the Rafinesque's big-eared bat and the southern myotis. Both species hold state-listed rankings of concern throughout their ranges, and are known to use mature forested wetlands (Mary K. Clark, personal communication). Other mammals associated with this watershed include forest wetland inhabitants such as deer, bobcat, raccoon, beaver, mink, river otter, marsh rabbit, and squirrel. Because of the diversity of habitat types throughout the watershed, the mammalian species composition varies from site to site.

Mammals likely found on the Refuge

Big brown bat
Red bat
Seminole bat
Hoary bat
Evening bat
Silver-haired bat

Longtail weasel
Beaver
Gray fox
Southern flying squirrel
Eastern gray squirrel
Eastern fox squirrel

Eastern pipistrel
 Rafinesque's big-eared bat
 Southeastern myotis
 Whitetail deer
 Bobcat
 Raccoon
 Opossum
 Eastern cottontail
 Marsh rabbit
 River otter
 Mink
 Feral Hogs

Golden mouse
 Eastern woodrat
 Rice rat
 Hispid cotton rat
 Meadow vole
 Pine vole
 Norway rat
 Black rat
 Shorttail shrew
 Eastern mole
 Black bear

3.3.2 Waterfowl: Coastal South Carolina has long been noted for its abundance of diverse and quality overwintering habitats and their significance to migratory waterfowl. The Winyah Bay drainage area, which includes the entire Refuge acquisition boundary, stands out as one of the most extensive, intact wetland complexes in the southeastern United States. The wetland habitats in the Refuge acquisition boundary range from forested, riverine floodplains to an extensive freshwater deltaic fan. The deltaic fan, in turn, contains a diversity of habitats such as managed wetlands, abandoned and unmanaged tidal ricefields, creeks, and flats. Acre for acre, the managed wetlands of the WBFA winter more ducks than any comparable habitat in South Carolina (WBFA Draft Plan 1994.) In addition to overwintering habitats, the Great Pee Dee and Waccamaw Rivers serve as flight corridors for waterfowl migrating along the coastal wetland wintering grounds. The forested wetlands where mature trees are present also provide important nesting habitat for wood ducks and hooded mergansers.

3.3.3 Neotropical Migratory Birds: The Refuge acquisition boundary presently contains extensive, contiguous flood plain forested wetlands interspersed with a diversity of habitat components such as isolated hummocks, remnant dikes, and a natural ridge and swale topography. This mosaic of habitats along with a specialized flora composition associated with each component, have a direct bearing on specific breeding nongame birds, particularly neotropical migrants, and their presence and use of existing habitats. Point count surveys conducted within the Refuge acquisition boundary have further demonstrated the importance of this wetland habitat diversity to several high priority species such as Swainson's warblers and swallow-tailed kites. Additionally, contiguous forested wetland ecosystems such as those represented within the Great Pee Dee and Waccamaw River watersheds undoubtedly serve as important habitat for other temperate migrant and resident species.

Neotropical migratory birds likely found on the Refuge

Common loon
 Brown pelican
 Anhinga
 Least bittern

Pied-billed grebe
 Double-crested cormorant
 American bittern
 Great blue heron

Great egret
Little blue heron
Cattle egret
Black-crowned night heron
White ibis
Wood stork
Tundra swan
Canada goose
Green-winged teal
Mottled duck
Northern pintail
Northern shoveler
American wigeon
Redhead
Greater scaup
Common goldeneye
Hooded merganser
Red breasted merganser
Black Vulture
Osprey
Mississippi kite
Northern harrier
Cooper's hawk
Broad-winged hawk
American kestrel
Peregrine falcon
Northern bobwhite
Clapper rail
Virginia rail
Purple gallinule
American coot
Greater yellowlegs
Spotted sandpiper
American woodcock
Ring-billed gull
Caspian tern
Sandwich tern
Least tern
Mourning dove
Yellow-billed cuckoo
Eastern screech owl
Barred owl
Chuck-will's-widow
Chimney swift
Belted kingfisher
Red-bellied woodpecker
Downy woodpecker
Red-cockaded woodpecker
Pileated woodpecker
Acadian flycatcher
Great crested flycatcher

Snowy egret
Tricolored heron
Green heron
Yellow-crowned night heron
Glossy ibis
Fulvous whistling-duck
Snow goose
Wood duck
American black duck
Mallard
Blue-winged teal
Gadwall
Canvasback
Ring-necked duck
Lesser scaup
Bufflehead
Common merganser
Ruddy duck
Turkey vulture
American Swallow-tailed kite
Bald eagle
Sharp-shinned hawk
Red-shouldered hawk
Red-tailed hawk
Merlin
Wild turkey
Black rail
King rail
Sora
Common moorhen
Killdeer
Lesser yellowlegs
Common snipe
Laughing gull
Herring gull
Royal tern
Forster's tern
Rock dove
Common ground-dove
Common barn owl
Great horned owl
Common nighthawk
Whip-poor-will
Ruby-throated hummingbird
Red-headed woodpecker
Yellow-bellied sapsucker
Hairy woodpecker
Northern flicker
Eastern wood-pewee
Eastern phoebe
Eastern kingbird

Purple martin
 N. rough-winged swallow
 Blue jay
 Fish crow
 Tufted titmouse
 Brown-headed nuthatch
 Sedge wren
 Marsh wren
 Ruby-crowned kinglet
 Eastern bluebird
 Swainson's thrush
 Wood thrush
 Gray catbird
 Brown thrasher
 Cedar waxwing
 European starling
 Solitary vireo
 Northern parula
 Black-throated green warbler
 Black-throated gray warbler
 Pine warbler
 Palm warbler
 American redstart
 Swainson's warbler
 Northern waterthrush
 Common yellowthroat
 Yellow-breasted chat
 Scarlet tanager
 Blue grosbeak
 Painted bunting
 Chipping sparrow
 Henslow's sparrow
 Savannah sparrow
 Seaside sparrow
 Swamp sparrow
 Bobolink
 Eastern meadowlark
 Boat-tailed grackle
 Brown-headed cowbird
 Purple finch
 House sparrow

Tree swallow
 Barn swallow
 American crow
 Carolina chickadee
 White-breasted nuthatch
 Carolina wren
 House wren
 Golden-crowned kinglet
 Blue-gray gnatcatcher
 Veery
 Hermit thrush
 American robin
 Northern mockingbird
 Water pipit
 Loggerhead shrike
 White-eyed vireo
 Red-eyed vireo
 Black-throated blue warbler
 Yellow-rumped warbler
 Yellow-throated warbler
 Prairie warbler
 Black and white warbler
 Prothonotary warbler
 Ovenbird
 Kentucky warbler
 Hooded warbler
 Summer tanager
 Northern cardinal
 Indigo bunting
 Rufous-sided towhee
 Field sparrow
 Vesper sparrow
 Sharp-tailed sparrow
 Song sparrow
 White-throated sparrow
 Red-winged blackbird
 Rusty blackbird
 Common grackle
 Orchard oriole
 American goldfinch

3.4 Threatened and Endangered Species

Seven federally listed endangered or threatened species are known to occur or potentially occur within the Refuge acquisition boundary. These include three species of birds, one species of fish, and three species of plants. They are as follows:

3.4.1 Red-cockaded woodpecker (*Picoides borealis*) – Endangered. Red-cockaded woodpeckers are known to nest in the Refuge acquisition boundary, with the principal population residing in the mature pine forest of Sandy Island. Specific data on this population is being maintained by The Nature Conservancy and SCDNR who manage the state-owned portion on Sandy Island. With the addition of lease lands on Sandy Island that are owned by Brookgreen Gardens, the Refuge will begin active monitoring the RCW population on these leased lands.

3.4.2 Wood stork (*Mycteria americana*) – Endangered. Nesting has been observed within the Refuge acquisition boundary however the two known rookeries are located on private land. The contiguous mature blocks of wetland habitats on Refuge lands provide suitable habitat for wood storks to nest, forage, and roost. Wood storks have been observed foraging and loafing on the Refuge but nesting has not been documented.

3.4.3 Shortnose sturgeon (*Acipenser brevirostrum*) – Endangered. The shortnose sturgeon is found in the rivers and creeks throughout the Refuge acquisition boundary.

3.4.5 Kirtland's Warbler (*Dendroica kirtlandii*) – Endangered. Although not known to occur in the Refuge acquisition boundary, potential habitat is present.

3.4.6 Pondberry (*Lindera melissifolia*) – Endangered. Although not known to occur in the Refuge acquisition boundary, potential habitat is present on Sandy Island and in other pineland areas.

3.4.7 Canby's dropwort (*Oxypolis canbyi*) – Endangered. Although not known to occur in the Refuge acquisition boundary, potential habitat is present on Sandy Island and in other pineland areas.

3.4.8 American chaffseed (*Schwalbea americana*) – Endangered. Although not known to occur in the Refuge acquisition boundary, potential habitat is present on Sandy Island and in other pineland areas.

3.4.9 Species of Concern: Nine species of plants and animals, considered by the USFWS to be Species of Concern, are known to occur or potentially occur within the Refuge acquisition boundary. Species of concern are those species for which available data suggest that a proposal to list the species may be appropriate, but conclusive data on vulnerability and threat are not currently available to support listing action. These species include the Bachman's sparrow (*Aimophila aestivalis*); Rafinesque's big-eared bat (*Plecotus rafinesquii*); Southeastern myotis bat (*Myotis austroriparius*); Carolina pygmy sunfish (*Elassoma boehlkei*); Eulophia (*pteroglossapis ecristata*); Sarvis holly (*Ilex amelanchar*); Pondspice (*Listea aestivalis*); Carolina birds-in-a-nest (*Macbridea caroliniana*); Carolina grass-of-parnassus (*Parnassia caroliniana*); and Well's pixie moss (*Pyxidanthra barbulata* var. *brevifolia*).

3.5 Invasive Wildlife Species

One of the most important invasive animal species is the feral hog. Feral hogs are currently distributed throughout the Refuge acquisition boundary. These animals were introduced to the eastern United States from Eurasia by early European settlers as a source of food. The feral swine population that exists today is a combination of domestic, escaped, or neglected domestic swine, Eurasian wild boar, or feral pigs, that have been captured for the purpose of starting wild, free-living populations. The rooting and wallowing activities of feral hogs cause serious erosion to river banks and areas along streams. Feral hogs carry diseases, such as swine brucellosis (APHIS 2005). They also compete for food with native wildlife, particularly acorns, which are an important food for both wild turkey and deer. Furthermore, feral hogs create wallows in wet sites, impinging on the integrity of the plant and soil community (Georgia Wildlife Web 2000).

3.6 Cultural Resources

The body of federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent Executive Orders. They include: 1) each agency is to systematically inventory the historic properties on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; 2) federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and; 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The USFWS, like other federal agencies, are legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The USFWS's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the USFWS's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiates consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Tribes.

There is currently one recorded historic property located on Waccamaw National Wildlife Refuge located on the Yauhannah Bluff Tract. The Yauhannah Bluff site was first identified by Richard Polhemus in 1972. A portion of this site was examined by Bill Weeks and Jim Michie of Coastal Carolina University in the early to mid 1990s through the excavation of shovel tests and test units. In 2002, New South Associates shovel tested the entire tract at a 65-foot interval using the permanent datum established by Jim Michie. In 2006, the USFWS contracted New South Associates to perform a data

recovery survey on the area closest to the Great Pee Dee River in order to mitigate any impacts to archeological resources that might be impacted during the construction of an environmental education center (Archeological Investigations at the Yourhaney Plantation (38GE18) Yauhannah Bluff, Waccamaw National Wildlife Refuge, Georgetown County, South Carolina. New South Associates Technical Report 1314, New South Associates, Columbia SC, May 1, 2006).

3.7 Wildlife-Dependent Recreation

Hunting around the Refuge is culturally important to the local community. If Alternative B is implemented, newly acquired or leased Refuge tracts would reduce commuting distances for hunters. Additionally, under this alternative, a careful balance of hunting seasons have been fully examined to ensure that hunting and other wildlife dependent recreation do not overlap. This alternative would also allow the public to enjoy quality hunting opportunities at little cost to the Refuge.

The Refuge hunt program has also increased the public awareness of the Refuge and to the National Wildlife Refuge System more so than almost every other public use program. This awareness has resulted in increased public support, which has evolved principally through hunters and fisherman, and it has resulted in significant private donations from local sporting goods outlets, which have been matched with grants and dedicated to building facilities for non-consumptive public uses. These facilities include boardwalks, docks, weather shelters, environmental education outposts, overlooks, and nature trails. Hunters also play a significant role in helping with law enforcement activities. Because Refuge staff resources are very limited, hunters provide vital tips that often lead to the conviction of poachers, illegal wildlife and plant possession, trespassing, wildlife disease, and public hazards.

3.8 Socioeconomic Environment

Waccamaw NWR includes portions of Georgetown, Horry, and Marion counties between the cities of Georgetown and Conway, about 16 miles north of Winyah Bay. Three primary urban centers are associated with the study area: the cities of Georgetown, Conway, and Myrtle Beach. The major area of growth is the Grand Strand, a 60-mile stretch of coastline between the Atlantic Ocean and the Waccamaw River in Georgetown and Horry counties. The Grand Strand is one of the nation's top vacation destinations, stretching from Pawley's Island north to the town of Little River near the South Carolina-North Carolina State line. The area has both a large resident population and a large tourist population, both of which are rapidly growing.

Georgetown County is about half as densely populated as the state (69 people per-square-mile vs. 133 people per-square-mile) but growing faster. In 2004, the county's estimated population was 59,790, about 1 percent of South Carolina's population of 4,198,068 (USCB 2006). The county population grew by 7.2 percent from 2000 to 2004, compared to South Carolina's 4.6 percent growth in the same four years. From 1990 to 2000, Georgetown County grew 20.5 percent compared to South Carolina's 15.1 percent in the same decade.

Horry County is more densely populated as the state (173 people per-square-mile vs. 133 people per-square-mile) and also growing faster. In 2004, the county's estimated population was 217,608, about 5 percent of South Carolina's population of 4,198,068 (USCB 2006). The county population grew by 10.7 percent from 2000 to 2004, compared to South Carolina's 4.6 percent growth in the same four years. From 1990 to 2000, Horry County grew 36.5 percent compared to South Carolina's 15.1 percent in the same decade.

Marion County is also about half as densely populated as the state (72 people per-square-mile vs. 133 people per-square-mile) but growing more slowly. In 2004, the county's estimated population was 35,086, about 0.8 percent of South Carolina's population of 4,198,068 (USCB 2006). The county population declined by 1.1 percent from 2000 to 2004, compared to South Carolina's 4.6 percent growth in the same four years. From 1990 to 2000, Marion County grew 4.6 percent, compared to South Carolina's 15.1 percent growth in the same decade.

In 2004, of the data available, accommodation and food services were the largest of twenty major economic and employment sectors in Georgetown and Horry counties, followed by retail trade (STATS Indiana 2006). Horry County is promoting rapid growth and development, while Georgetown County is striving to provide an environment more conducive to a slower pace of development. Manufacturing was the largest sector in Marion County. Employment by major industrial sectors is shown in Table 1.

Table 1. Employment of civilian population 16 years and older by industry

Industry	Georgetown County	Horry County	Marion County
Agriculture, Forestry, Hunting	2.2%	0.3%	N/A
Mining	0.2%	0.1%	N/A
Construction	7.4%	8.5%	3.0%
Manufacturing	9.4%	4.1%	28.3%
Wholesale Trade	1.8%	1.9%	N/A
Retail Trade	13.7%	17.1%	13.0%
Transportation and Warehousing	1.5%	1.5%	3.8%
Utilities	0.4%	0.3%	N/A
Information	0.8%	1.5%	N/A
Finance and Insurance	2.2%	3.8%	2.8%
Real Estate	2.8%	4.0%	0.3%
Professional and Technical Services	N/A	2.6%	N/A
Management of Companies	N/A	0.4%	N/A
Waste Services	4.6%	4.8%	N/A
Educational Services	0.3%	0.3%	10.2%
Health Care and Social Assistance	8.7%	7.5%	8.4%
Arts, Entertainment, Recreation	3.5%	5.0%	0.5%
Accommodation and Food Services	15.3%	23.6%	6.6%
Other Services	2.3%	2.5%	1.8%
Public Administration	5.5%	3.5%	7.3%

Source: STATS Indiana 2006 (Note: N/A = data not available)

South Carolina's statistics are slightly below the national averages for persons below the poverty line, median household and per capita income, and educational attainment levels (USCB 2006). Georgetown and Horry counties conform to this profile, but Marion County fares a little worse (Table 2). In terms of race and ethnicity, whites and blacks dominate both the county and the state populations.

Table 2. Comparison of demographic statistics for Georgetown, Horry, and Marion Counties, South Carolina, and the USA

Location	Median Household Income	Per Capita Income	% Below Poverty	% High School Graduates	% Bachelor Degree	% White	% Black	% Hispanic	% Asian	% Native American
Georgetown County	\$35,312	\$19,805	17.1	75.2	20.0	59.7	38.6	1.6	0.2	0.1
Horry County	\$36,470	\$19,949	12.0	81.1	18.7	81.0	15.5	2.6	0.8	0.4
Marion County	\$26,526	\$13,878	23.2	68.0	10.2	41.7	56.3	1.8	0.3	0.3
South Carolina	\$37,082	\$18,795	14.1	76.3	20.4	67.2	29.5	2.4	0.9	0.3
USA	\$41,994	\$21,587	12.4	80.4	24.4	75.1	12.3	12.5	3.6	0.9

Source: USCB, 2006

Chapter 4: Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing each of the management alternatives in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as “impacts” or “effects.” When detailed information is not available, those comparisons are based on the professional judgment and experience of Refuge staff and USFWS and State biologists.

4.1 Effects Common to all Alternatives

4.1.1 Refuge Physical Environment

Impacts of each of the alternatives on the Refuge’s physical environment would be similar and have minimal, negligible additive effects on the physical environment. The Refuge is limited to foot access for all approved public uses which minimizes habitat degradation and disturbance to surface soils and topography.

Impacts of each of the alternatives on the natural hydrology would also be similar in that they would be expected to have negligible effects on the natural hydrology. The Refuge expects impacts of each of the alternatives to air and water quality to be similar in having minimal effects primarily related to Refuge visitors’ automobile and boat emissions on roads, creeks and rivers used to access Refuge lands. The cumulative effect of these Refuge-related activities on overall air and water quality in the region would also be similar between alternatives and the additive effects would be negligible due to premise that these public use constituents would be making longer trips to have the same

experiences if the Refuge did not allow the public uses outlined in each alternative. Existing State water quality criteria and use classifications are acceptable however; recognition from environmental groups of shortfalls in current legislation has increased awareness of legislators in hopes that these laws will be improved to achieve improved on-Refuge environmental conditions. Thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with each alternative on solitude and the quality of the outdoor experience are expected to be similar and minimal given the complexity and remoteness of access for hunters which will preclude many visitors from accessing areas open to hunting. Although some public use areas such as trails might be temporarily closed during Refuge hunts, these impacts are mitigated by having two significant public use areas which are closed year-round to hunting to help prevent conflicts during Refuge hunts.

4.1.2 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities' access to public information and participation in matters relating to human health or the environment. There are several rural communities adjacent to the Refuge that meet some part or all of the criteria identified and protected by Executive Order 12898.

With respect to impacts that may adversely effect minority or low-income populations in the affected area, this EA has not identified any adverse environmental or human health effects specific to any of the alternatives.

4.1.3 Public Health and Safety

The Refuge is a suburban Refuge with many miles of urban/wildland interface along its boundary. As wildlife habitats and migratory corridors diminish, human/wildlife encounters are becoming more common and problematic. State law enforcement officers are spending a disproportionate amount of their annual tour of duty addressing nuisance animal complaints (SCDNR personal communications). High population densities of deer and feral hogs can lead to increased automobile collisions, property damage, and nuisance complaints. In 2010, 24 deer-vehicle collisions in Georgetown County, 85 in Horry County, and 19 in Marion County were reported to the South Carolina Department

of Public Safety. These collisions numbers are a significant increase to those reported in 2006 (SCDNR, 2010). In the more rural portions of the Refuge, increased crop damage and degradation to dikes, roads, and levies can result. High deer numbers are also implicated in the rapid increase in the incidence of Lyme's disease in humans.

As a result of the growing number of human/wildlife incidents many homeowner associations and insurance companies are requesting local and state agencies to control populations through depredation permits to reduce populations down to a manageable level. Under Alternative A, the "No Action" alternative, hunting would be prohibited on future acquired and leased Refuge tracts and would not help reduce the risk of the above mentioned concerns. Under Alternative B, hunting on newly acquired or leased Refuge tracts would reduce the risk of public health and safety issues.

4.1.4 Cultural Resources

Under each alternative, impacts to cultural resources on the Refuge are similar in that none of the public uses allowed under each alternative would increase opportunities for impacts to cultural resources. All known areas containing cultural resources are generally closed to public access and/or every effort is taken by the Refuge to protect these sites. Hunting, regardless of method or species targeted, is a public use activity that does not pose any additive threat to historic properties on and/or near the Refuge. Additionally, the removal of feral hogs through hunting would be a significant measure against the destruction of significant archeological resources that can be uncovered or displaced by feral hog rooting and wallowing.

4.1.5 Facilities

The Service defines facilities as: "Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc". Annual maintenance or improvement(s) of existing facilities (i.e. parking areas, roads, trails, boat ramps and buildings) for each alternative is similar in that it may cause minimal short term impacts to localized soils and waters, and, may cause some wildlife disturbances and damage to vegetation when being performed by Refuge staff. Facility maintenance and improvement activities are periodically conducted to accommodate daily Refuge management operations and general public uses such as wildlife observation and photography. When these activities are necessary, they will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. Siltation barriers will be used to minimize soil erosion, and all disturbed sites will be restored to as natural a condition as possible.

The Refuge has no new facilities planned for new Refuge parcels to administer the hunting program. Cox Ferry Lake Recreation Area facility completed in 2010 is closed to hunting. ATVs and other land conveyance vehicles are not allowed on Refuge roads or trails. Under all of the alternatives, adverse effects to existing facilities would be the same. Almost all of the existing Refuge maintained parking areas, roads and trails are located on two Refuge tracts which will be closed year-round to hunting. The only

facilities that will be utilized during Refuge hunts by hunters are existing parking areas and boat ramps that are public facilities, which are open year-round and maintained by the county or state. Due to the high number of boat landings adjacent to the Refuge, there should be minor impacts of these facilities during Refuge hunts.

4.2 Summary of Effects

4.2.1 Impacts to Habitat

Alternative A (No Action) – Current Management

Under this alternative, hunting would not be opened to the public on any future acquired or leased tracts of the Refuge. Negative impacts to wildlife habitat would be expected on these tracts based on studies showing negative impacts to wildlife habitat and population interrelationships caused by an overabundance of deer. For example, allowing the Refuge deer herd population on future properties to increase without hunting those properties as a method to manage deer populations could result in significant negative impacts on other plant and animal species. When habitat carrying capacity is exceeded, competition for limited food resources results in overbrowsing by deer. Severe overbrowsing alters plant species composition, distribution, and abundance, and reduces understory structural diversity. These changes may have a deleterious impact on local animal communities which depend on healthy vegetative systems for food and cover (Ellingwood and Caturano 1988).

A separate category of negative impacts that must be considered is the economic impacts related to forest and farm land habitats on adjoining landowners. Approximately one-half of the Refuge acquisition boundary adjoins urban/suburban residential areas. By not allowing any hunting on the newly acquired tracts, these impacts would not only occur on the new tracts but they would also increase on adjoining lands.

Alternative B (Proposed Action): 2012 Waccamaw NWR Recreational Hunting Management Plan

Under this alternative, hunting on future acquired or leased Refuge tracts would be opened to the public on a limited basis. Impacts to Refuge habitats would be reduced, due in part, to the management of the deer and feral hog population. No additive impacts from the use of ATVs or other off-road vehicles would occur because of the standing Refuge policy that prohibits the use of land vehicles including ATVs for Refuge hunts.

Ecological benefits derived from regulated hunting include protection of wildlife habitats from overbrowsing (Behrend et al. 1976), protection of species diversity of flora and fauna that may be negatively impacted by deer and hog overpopulation, and the maintenance of healthy, viable deer populations (McCullough 1979). Hunting pressure on private lands within and adjacent to the Refuge acquisition boundary has historically been a significant factor in influencing seasonal wildlife immigration to Refuge lands. By

providing limited hunting on the Refuge, these seasonal population swings can provide opportunities to positively impact the overall population, thus influencing herd health and wildlife habitats both on the Refuge and on adjoining private lands.

Additionally, all Refuge administered lands within each respective hunt unit will be managed uniformly and open to hunting during the restricted hunting seasons. Public information management related to the 2012 Hunt Plan will be consistent and uniform making it easier to manage by the Refuge.

4.2.2 Impacts to Hunted Wildlife

Alternative A (No Action) – Current Management

Under this alternative, hunting would not be opened to the public on newly acquired or leased Refuge tracts. Mortality of individually hunted animals as a result of a sanctioned Refuge hunt would not occur under this alternative; however, poaching is an on-going challenge on closed hunting areas, so some mortality could still occur. Disturbance by Refuge hunters to wildlife would not occur; however, other public uses that cause disturbance, such as hiking, wildlife observation and photography, & environmental education and interpretation would still occur. Because most of the Refuge is bisected by a multitude of navigable, public waterways which the Refuge has no management authority over, disturbance by public waterfowl hunting, boating, & fishing on the creeks and rivers will exist with or without allowing hunting.

In the absence of regulated hunting, wildlife populations on newly acquired Refuge lands could become unbalanced favoring more adaptive and opportunistic species such as feral hogs, white-tailed deer, raccoons and squirrels. Due to the decline or lack of natural predators, these populations would expand beyond the biological carrying capacity of the land causing environmental and health threats. For example feral hog populations can increase by 300% in one year without any measure of predatory control. Sexual maturity in wild hogs is generally reached before the end of the first year of life (Sweeney 1970, Barrett 1978) and in the Southeast; hogs are sexually active and will breed throughout the year. Feral hogs can harbor several infectious diseases, some of which can be fatal to native wildlife. Additionally, feral hogs compete directly for food with deer, bears, turkeys, squirrels and many other birds and mammals.

Deer herd densities can double in one year (McCullough 1979) and depending on habitat quality can increase to levels exceeding the carrying capacity as quickly as two to three years. Deer herds at upper density limits consist of deer in relatively poor health (Dasmann 1981). High density herds are prone to cyclic population fluctuations and catastrophic losses (McCullough 1979). Dickinson (1983) reported white-tail deer harvested from New York's Bear Mountain-Harriman State Park, following a 71 year history of no hunting, were the poorest physical specimens ever recorded in New York and possibly in the northeast. The likelihood of starvation and diseases, such as bluetongue and EHD in deer and distemper and rabies in raccoon and opossum, would increase, as would vehicle-deer collisions.

Alternative B (Proposed Action): 2012 Waccamaw NWR Recreational Hunting Management Plan

Under this alternative, hunting would be open to the public on current and future acquired or leased Refuge tracts on a limited basis, in accordance with the 2012 Hunt Plan.

Regulated hunting has been proven to be an effective deer population management tool (Hesselton et al. 1965). In addition, it has been shown to be the most efficient and least expensive technique for removing deer (Palmer et al. 1980). For feral hogs, regulated hunting may not reduce hog populations to desired levels; however, it will contribute to the on-going efforts of the Refuge to control this invasive species. Reduction of the hog population would also decrease risk of transmitting fatal diseases by hogs to other wildlife species. Fewer hogs would decrease competition for food with native wildlife, such as deer, bear, turkey, and squirrel. Special hunting seasons for hogs may be implemented to further reduce populations beyond those taken during the prescribed deer seasons. Hunting seasons for all species may be adjusted annually to take into consideration changes indicated in herd quality by other biological monitoring (APC's, body weights, age ratios, antler size, and reproductive rates). Additionally, the hunting season structure will be based on hunter success, and sex-age-kill ratios. The likelihood of starvation and diseases, such as bluetongue and EHD in deer would be decreased as would deer-vehicle collisions.

Public waterfowl hunting provides an economical means for statistical data collection. Random checks of hunters can provide kill ratios, population composition, and bird habit data as well as the possibility of organ collection (gizzards, etc.) for various studies. However, wildlife disturbance associated with waterfowl hunting does impact diurnal and nocturnal use of an area by waterfowl (Cronan 1957, McNeil et al. 1992, Paulus, 1984). Disturbance associated with a Refuge hunt may have an additive effect on reducing waterfowl use within the hunt area; however it will be minimal in areas where unrestricted public hunting already occurs in nearby public waters.

There are, however, management tools that can be used to minimize and/or mitigate disturbance and the interruption of use of Refuge habitats by wintering waterfowl. Afternoon closure of hunting reduces disturbance (Gordon et al. 1989) as well as reduces the total take of waterfowl (Kirby et al. 1983). Managed wetlands that are not hunted provide areas that are utilized as resting and feeding areas when adjacent areas are hunted (Gordon et al. 1989, Paulus 1984). Privately owned managed wetlands as well as natural bays, ponds, oxbows, and tidal marshes within or adjacent to the Refuge acquisition boundary that are permanently set aside for waterfowl sanctuary are few and far between. The few areas that have been set aside as wildlife sanctuaries are heavily used by waterfowl during the day as resting/loafing areas. Many of these areas are now being impacted by land use changes as commercial development continues to grow throughout the region. As Refuge tracts are acquired, consideration will be given to closing isolated water areas to provide additional waterfowl rest sites on the Refuge. For instance, waterfowl hunting is currently allowed only on Refuge parcels in Unit 1 that are bounded

by the Great Pee Dee River. There are several Refuge parcels in Unit 2 closed year-round to all public use activities, which provide sanctuary for many species of wildlife including waterfowl. Mitigation measures such as this will continue to be incorporated into the Refuge hunt program as well as other restrictions such as noon closure to waterfowl hunting, and opening no more than 60% of the Refuge to waterfowl hunting.

For upland/small game species, negative impacts of this alternative will be minimal. Woodcock hunting would be added as an additional hunting opportunity on Refuge lands and monitored accordingly during hunting season to maintain healthy population levels.

Studies show that there are only small differences in density and/or mortality rates in squirrels and rabbits on hunted versus non-hunted populations (Mosby 1969, Rose 1977). As a result, limited hunting mortality does not affect the overall status of these species however it would help to lower the risk of diseases such as rabies and distemper that can plague many small game species. Additionally, hunting of these species will cause only minimal disturbance to other wildlife populations. Everett (1982), monitored movements of wild turkeys before, during and after squirrel, deer and turkey hunts and found no permanent movement out of established ranges which could be attributed to hunting.

Furthermore, if Refuge turkey hunts are implemented in the future, disturbance to target and non target species should be minimal due to the nature of turkey hunting itself. Throughout the Refuge acquisition boundary, many adjoining landowners manage intensively for wild turkey and consequently, turkey populations on Refuge owned tracts often fluctuate as the turkey flocks move back and forth between federally owned and private property. Additionally, because of the difficulty of physical accessing many tracts and due to seasonal habitat availability related to river levels, turkey hunting may be physically restrictive; and therefore, should have minimal direct and/or indirect impacts on the resident wild turkey population.

4.2.3 Impacts to Non-hunted Wildlife

Alternative A (No Action) – Current Management

Hunting has proven to be an effective management tool to manage for both hunted and non-hunted wildlife at Waccamaw NWR. Under this alternative, hunting would not be opened to the public on newly acquired and future Refuge tracts on the Refuge. Increased disturbance to non-hunted wildlife would not occur as a result of hunting on newly acquired Refuge lands however, most if not all of these Refuge lands would be open to the public which could cause equal disturbance to wildlife.

By not having proven population management tools such as hunting on newly acquired and future Refuge lands, many wildlife populations could become unbalanced causing many other habitat and wildlife population impacts. For example, research conducted by USFWS on alligator snapping turtles has demonstrated significant depredation of turtle nest eggs from raccoons. The likelihood of inter-specific disease outbreaks from raccoons and opossum, such as distemper and rabies, would affect all mammalian species including rare bats that inhabit the Refuge. Based on Refuge monitoring prior to the

establishment of a hunt program, feral hog populations would increase dramatically under this alternative.

Furthermore, prior to a Refuge hunting program at Waccamaw NWR, illegal introduction of feral hogs became a law enforcement challenge as poachers would release female hogs on non-hunted Refuge lands so that they would be protected until they needed them to for illegal sale and release on private game farms. By not hunting feral hogs, the feral hog populations will rapidly increase and habitat destruction and impacts to other wildlife will reach epidemic proportions on the Refuge.

Alternative B (Proposed Action): 2012 Waccamaw NWR Recreational Hunting Management Plan

Under this alternative, hunting would be opened to the public on current and future acquired and leased Refuge tracts on a limited basis. Populations of raccoon would be decreased through hunting. With hunted (managed) raccoon populations, depredation rates of songbirds, turkeys, turtles, and their nests would decrease. Feral hog populations would be reduced, thereby decreasing predation of prey, such as ground nesting birds, and small mammals.

Under this alternative, disturbance to non-hunted wildlife will have little to no effect. Refuge access for hunting is primarily restricted to alluvial ridges and hammocks fronting the river. Boat access is required for these areas and this alone precludes many hunters from participating in Refuge hunts. The broad spans of forested floodplain wetlands along the Great Pee Dee and Waccamaw Rivers, allows most wildlife species, including those species permitted to be hunted, to seek cover quickly within the often impenetrable interior swamps. Disturbance to the daily wintering activities, such as feeding and resting, of birds might occur, but would be transitory as hunters traverse habitats along the rivers edge. Under State regulations, hunting Black bear and American alligators is permitted. However, the USFWS will continue to prohibit any take of alligators and bear on Refuge lands. Federal law enforcement officers will strictly enforce regulations to prohibit the take of any alligators or black bear on Refuge lands year-round.

Other wildlife disturbances will be minimized under this alternative and implementation of Refuge specific regulations will be structured to reduce these impacts. Closure to the use of ATV's, restrictions on use of dogs, weapons, and access are some hunting regulations used to limit non-hunted wildlife disturbances.

4.2.4 Impacts to Endangered and Threatened Species

An Intra-Service Section 7 Evaluation Consultation was completed for the 2007 Hunt Plan, in 2008 for the CCP, and the 2009 Hunt Plan. Additionally, one was completed in December 2011 for the 2012 Hunt Plan.

Seven federally listed endangered or threatened species are known to occur or potentially occur within the proposed boundary of the Refuge. These include three species of birds, one species of fish, and three species of plants (listed in Section 3.4). If wood stork or RCW nesting activity occurs on, or nearby Refuge lands, closed areas will be established to buffer the nesting area from any human disturbance and/or activity associated with any permitted public use. This requirement would be the same with or without hunting. For instance, RCW nesting has been documented to be on the Refuge's leased upland portion of Sandy Island. Because this area will be closed altogether to hunting, it has been determined that the proposed action of opening hunting to newly acquired or leased Refuge tracts is not likely to adversely affect these species. Because of seasonal use parameters listed above and the legal authority available to Refuges to close areas to public access when necessary, no one alternative would be any more likely to adversely affect threatened and endangered species than another.

4.2.5 Impacts to Wildlife-Dependant Recreation

Compatible wildlife-dependant recreation will change under either alternative. The Refuge was established specifically to provide opportunities for hunting, fishing, wildlife observation and photography, and environmental education and interpretation. As Refuge parcels are acquired, these areas will be opened to public use activities.

As public use levels expand across time, unanticipated conflicts between user groups may occur. These conflicts can be mitigated by providing competing interests groups with alternative access opportunities as well as special interest outreach forums. For example, the Refuge has developed an environmental education center along with a recreation area with multi conveyance access (ie. boat, car, bike or foot). Both facilities are closed to hunting and they provide Refuge visitors with spectacular recreational opportunities on a year-round basis.

4.2.6 Impacts to Facilities (roads, trails, parking lots, levees)

Annual maintenance or improvement(s) of existing facilities (i.e. parking areas, roads, trails, boat ramps and buildings) for each alternative is similar in that it may cause minimal short term impacts to localized soils and waters, and, may cause some wildlife disturbances and damage to vegetation when being performed by Refuge staff. Facility maintenance and improvement activities are periodically conducted to accommodate daily Refuge management operations and general public uses such as wildlife observation and photography. When these activities are necessary, they will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. Siltation barriers will be used to minimize soil erosion, and all disturbed sites will be restored to as natural a condition as possible.

The Refuge has no new facilities planned for new Refuge parcels to administer the hunting program. Cox Ferry Lake Recreation Area facilities completed in 2010 are closed to hunting. ATVs and other land conveyance vehicles are not allowed on Refuge roads or trails. Under all of the alternatives, adverse effects to existing facilities would be

the same. Almost all of the existing Refuge maintained parking areas, roads and trails are located on two Refuge tracts which will be closed year-round to hunting. The only facilities that will be utilized during Refuge hunts by hunters are existing parking areas and boat ramps that are public facilities, which are open year-round and maintained by the county or state. Due to the high number of boat landings adjacent to the Refuge, there should be no noticeable impacts of these facilities during Refuge hunts.

4.3 Cumulative Impacts Analysis

4.3.1 Anticipated Direct and Indirect Impacts of Proposed Action on Wildlife Species.

4.3.1.1 Migratory Birds

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the USFWS as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the USFWS has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each state and Province in that Flyway. Waccamaw NWR is within the Atlantic Flyway.

The USFWS, working with partners, annually prescribe frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow State selections of season and limits for recreation and sustenance; aid Federal, State, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the USFWS annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which States may select season dates, bag limits, shooting hours, and other options for each of the migratory bird hunting seasons. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

States may always be more conservative in their selections than the Federal frameworks but never more liberal. Furthermore, season dates and bag limits for NWR's open to hunting can never be any longer or larger than the State regulations. Each new Refuge hunt must develop an environmental assessment when the NWR opens a new hunting activity, and based upon the findings of the EA, season dates and bag limits are then set. In the case of Waccamaw NWR, waterfowl hunts for example are restricted to two half days per week only on Refuge lands along the Great Pee Dee River and only allowed until noon throughout the state waterfowl season. As a result of this restrictive framework, annual waterfowl harvest estimates is anticipated to be on average, approximately 25 additional wood ducks harvested each year on the Refuge managed hunts. This harvest impact represents a mere 0.001% of South Carolina's four-year average harvest of 80,440 wood ducks (USFWS, 2006). Additionally, the Refuge has created a contiguous 12,323 acre waterfowl sanctuary along the Waccamaw River sections of the Refuge. This area is becoming an important habitat resource for wintering a significant proportion of the wintering wood duck population in an area of the Refuge where State or private sanctuaries have not existed before.

Wood cock hunting is also proposed to be opened for the first time on Waccamaw NWR. The areas opened to woodcock hunting are the same areas that are currently open to waterfowl hunting so little to no increases in wildlife disturbance will occur from the new hunt. During 2010, the Refuge conducted periodic surveys on wetlands in Unit 1 to see what the wintering populations are on the areas that will be opened for woodcock. Although wintering numbers fluctuate depending on weather and soil moisture, these areas consistently held huntable populations of woodcocks. Furthermore, in a study done by U.S. Geological Patuxent Wildlife Research Center in 2005 (McAuley *et al.* 2005), study results showed no significant differences in woodcock survival between hunted and non-hunted areas. Furthermore, the authors concluded that hunting was not having a considerable impact on woodcock numbers in the Northeast (McAuley *et al.* 2005).

Snipe hunting is also proposed for the tidal wetland marshes in Unit 3 and on a much more restricted basis (two days a week for one month of the season or approximately eight days) than allowed by South Carolina state regulations. In addition to restricted hunting days, non toxic shot is required to be used by hunters. This Refuge restriction further restricts hunters, possibly even more than days open, due to the lack of availability of smaller shot sizes in non toxic shot. Other factors such as weather, daily tidal cycles, and private lands, which are rarely hunted for snipe, will have additive impacts on hunter success. Based on the USFWS Harvest Report (USFWS, 2011), snipe harvest estimates for South Carolina for 2009 and 2010 were 1,900 and 7,400 respectively. Seasonal harvest in SC per hunter was 1.6 in 2009 and 5.2 in 2010. Total harvest of snipe for the Atlantic Flyway was 43,600 in 2009 and 54,000 in 2010. Although flyway harvest did not vary significantly between 2009 and 2010, seasonal harvest variations for South Carolina did which demonstrates how weather may be a significant factor in hunter success throughout the state. Based on hunters interviewed during Refuge hunts, the overall harvest for Waccamaw NWR will be on average approximately 20 birds per year.

4.3.1.2 Resident Big Game

4.3.1.2.1 Deer

Home range size in mammals often decreases as population density increases (Sanderson 1966). Bridges (1968) and Smith (1970) both observed a threefold increase in home-range size following a die-off in a Florida deer population. Adult bucks generally have larger home ranges than does and these ranges can vary in size due to many environmental factors. In Florida, minimum home ranges averaged 622.8 hectares (1,539 acres) for two mature bucks, and 153.0 hectares (606 acres) for two does, and 153.0 hectares (378 acres) for a buck fawn (Smith 1970). Deer hunting does not have regional population impacts due to restricted home ranges of white tailed deer. Therefore, only local impacts are likely to occur from deer hunting on the Refuge.

Deer herd health checks are conducted every 5 years on most NWR's by the Southeast Cooperative Wildlife Disease Study at the University of Georgia. In 2005, the health check report for Waccamaw NWR stated that "Although continuation of current herd density may result in declines in herd health or higher rates of disease-induced mortality, the data suggests that some level of covert mortality may be present. These losses will predominantly affect younger animals, 4-12 month of age, mainly during winter and early spring, and will be associated with parasitism by stomach worms (*Haemonchus contortus*) and lungworms (*Dictyocaulus viviparus*). Any significant increase in density likely would result in declines in population health from this density-dependent parasitism/malnutrition syndrome."

Harvest and survey data confirm that decades of deer hunting on surrounding private lands (using bait and a longer season) have not had a local cumulative adverse effect on the deer population. The State estimates that 222,649 deer were harvested in South Carolina in 2010 (SCDNR, 2010). Harvest records by each county indicate that Georgetown County harvested 4,741 deer in 2010. This total harvest also computes to 84.3 acres/deer or 7.6 deer/square mile. For Horry County, 4,613 deer were harvested in 2010 which also computes to 115.6 acres/deer or 5.5 deer/square mile (SCDNR, 2010). Harvest rates on Refuge lands have been significantly lower than private lands adjoining the Refuge due to the allowance of baiting, longer seasons and no restrictions of method of take on private lands.

4.3.1.2.2 Feral Hogs

Feral hogs are an extremely invasive introduced non-native species and are not considered a game species by the State. No bag limits are established for feral hogs. Hunting of feral hogs provides the Refuge with another management tool in reducing this detrimental species, and at the same time, is widely enjoyed by local hunters. Cumulative effects to an exotic, invasive species should not be of concern because the Refuge would like to extirpate this species on Refuge lands. Hunting of hogs is not considered detrimental to the biological integrity of the Refuge, is not likely to create

conflict with other public uses, and is within the wildlife-dependant public uses to be given priority consideration. Since hogs are exotic, they are a priority species for Refuge management only in terms of their negative impacts on Refuge biota and need for eradication. Georgetown County, South Carolina ranked 6th in the state for overall hog harvest in 2009 and 9th in 2010 (SCDNR, 2010). They are a popular hunted species, and the public interest would best be served by allowing this activity on the Refuge. However, even with hunting, feral hogs are likely to always be present because they are prolific breeders.

4.3.1.2.3 Wild Turkey

Turkeys are non-migratory and therefore hunting only impacts the local population. Because Refuge turkey hunting would be restricted to Refuge tracts along the Great Pee Dee River, frequent flooding along with many other environmental circumstances often further impedes hunter success. Based on harvest data from six South Carolina Department of Natural Resources youth turkey hunts, the overall harvest rates were less than 40% unless accompanied by a professional guide (personal communications with SCDNR Biologist). These data indicate that the local turkey population has withstood hunting on surrounding private lands for several years without negative cumulative effects on turkeys. Therefore, the Refuge should not cumulatively adversely impact the population.

4.3.1.3 Small Game (Squirrel, Raccoon, Opossum,)

Squirrels, raccoon, and opossum cannot be affected regionally by Refuge hunting because of their limited home ranges. Only local effects will be discussed. Opossum and raccoon are hunted primarily at night. Raccoon are more sought after than opossum by the public. Hunting helps regulate opossum and raccoon populations; however, unless the popularity of this type of hunting increases, raccoons and opossums numbers will always be higher than desired. When these species become extremely overabundant, diseases such as distemper and rabies reduce the populations. However, waiting for disease outbreak to regulate their numbers can be a human health hazard. Cumulative adverse impacts to raccoon and opossum are unlikely considering they reproduce quickly, are difficult to hunt due to their nocturnal habits, and are not as popular for hunting as other game species.

Studies have been conducted within and outside of South Carolina to determine the effects of hunting on the population dynamics of small game. Results from studies have consistently shown that small game, such as squirrels, are not affected by hunting, but rather are limited by food resources. Refuge staff consulted with State biologists in association with this assessment on the cumulative impacts of hunting squirrel, raccoons and opossum. Although overall State harvest data was unavailable for South Carolina for these species, the Refuge hunt program is not expected to have any significant impact even on local populations of these species due to limited Refuge access and frequent flood events. Under the proposed action, the Refuge estimates a maximum additional 50 squirrels would be harvested and 65 raccoons. Gray squirrels are prolific breeders and

their populations have never been threatened by hunting in South Carolina even prior to the passing of hunting regulations as we know them today.

4.3.1.4 Non-hunted Wildlife

Non-hunted wildlife would include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, rabbits, and bats; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory bats, butterflies and moths, the remainder of these species has very limited home ranges and hunting could not affect their populations regionally; thus, only local effects will be discussed.

Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including cardinals, titmice, wrens, chickadees, etc. The cumulative effects of disturbance to non-hunted migratory birds under the proposed action are expected to be negligible for the following reasons: Hunting season would not coincide with the nesting season; and disturbance to the daily wintering activities, such as feeding and resting, can be mitigated by the expanses of wetland habitats that are inaccessible to hunters. Additionally, many of the disturbances caused by hunters are related to access the Refuge and human/wildlife interactions and these are also caused by many other public use groups including non-hunters.

The cumulative effects of disturbance to other wildlife under the proposed action are also expected to be negligible to nonexistent. Small mammals, including bats, are inactive during winter when hunting season occurs. These species are also nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters would rarely encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in the early fall are few and should not have cumulative negative effects on reptile and amphibian populations. Invertebrates are also not active during cold weather and would have few interactions with hunters during the hunting season. The Refuge has estimated current hunter density on peak days to be no more than 1 hunter per 1000 acres. During the vast majority of the hunting season, hunter density is much lower (1 hunter/3,000 acres). Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles and ATVs are prohibited on Refuge roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Although ingestion of lead-shot by non-hunted wildlife could be a cumulative impact, it is not relevant to the Refuge because the use of lead shot would not be permitted for any type of hunting.

Some species of bats, butterflies and moths are migratory. Cumulative effects to these species at the "flyway" level should be negligible. These species are in torpor or have

completely passed through South Carolina by peak hunting season in Nov-Jan. Some hunting occurs during September and October when these species are migrating; however, hunter interaction would be commensurate with that of non-consumptive users.

4.3.1.5 Federally Threatened or Endangered Species

An Intra-Service Section 7 Evaluation Consultation was completed for the 2007 Hunt Plan, in 2008 for the CCP, and the 2009 Hunt Plan. Additionally, one was completed in December 2011 for the 2012 Hunt Plan.

Seven federally listed endangered or threatened species are known to occur or potentially occur within the proposed boundary of the Refuge. These include three species of birds, one species of fish, and three species of plants (listed in Section 3.4). If wood stork or RCW nesting activity occurs on, or nearby Refuge lands, closed areas will be established to buffer the nesting area from any human disturbance and/or activity associated with any permitted public use. This requirement would be the same with or without hunting. For instance, RCW nesting has been documented to be on the Refuge's leased upland portion of Sandy Island. Because of the legal authority available to Refuges to close areas to public access when necessary, no one alternative would be any more likely to adversely affect threatened and endangered species than another.

4.3.2 Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources.

4.3.2.1 Wildlife-Dependant Recreation

As public-use levels expand over time, unanticipated conflicts between competing user groups may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities. Experience has proven that time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts between user groups. The Refuge has traditionally focused more resources on establishing public-use areas that are closed year-round to hunting than it has on hunting programs.

The level of recreational use and ground-based disturbance from visitors would be largely concentrated on trails and the Refuge's office and maintenance areas. This use should remain the same or increase as interests grows at the same rate with or without hunting. Access to more areas will remain a Refuge priority; however, the lay of the land will preclude most areas from increased visitor access.

The opportunities for hunting would be increased under the proposed action. High deer, feral hog, and raccoon numbers are recognized as a problem causing crop damage, reducing some forest understory species, and reducing reforestation seedling survival. Hunting would be used to keep these populations as well as other resident wildlife populations in balance with the habitat's carrying capacity, resulting in long-term positive

impacts on wildlife habitat.

The Refuge prohibits all land conveyance vehicle access for any public use on the Refuge to minimize wildlife disturbance and habitat degradation. Some areas, such as waterfowl sanctuaries, would be closed seasonally to hunting to minimize disturbance to wintering waterfowl.

4.3.2.2 Refuge Facilities

The Service defines facilities as: "Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc." Under the proposed action those facilities most utilized by hunters are: parking lots and boat launching ramps. Because hunters are permitted to access the Refuge by foot only, no additional maintenance or improvements of existing facilities will be required.

4.3.2.3 Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an "undertaking" that triggers a federal agency's need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

- 1- an undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the "area of potential effect;" and
- 2- the project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required.

4.3.3 Anticipated Impacts of Proposed Action on Refuge Environment and Community.

The Refuge expects no sizeable adverse impacts of the proposed action on the Refuge environment which consists of soils, vegetation, air quality, water quality, and solitude. Hunting would benefit vegetation as it is used to keep many resident wildlife populations in balance with the habitat's carrying capacity. The Refuge would also control access to minimize habitat degradation.

The Refuge expects impacts to air and water quality to be minimal and only due to boat emissions traveling to and from Refuge lands. The effect of these Refuge-related activities, as well as other management activities, on overall air and water quality in the region are anticipated to be relatively negligible, compared to the contributions of

industrial centers, power plants, and non-Refuge vehicle traffic. Existing State water quality criteria and use classifications are minimal but are improving to achieve desired on-Refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given time and space zone management techniques, such as seasonal access and area closures, used to avoid conflicts among user groups.

The Refuge would work closely with State, Federal, and private partners to minimize impacts to adjacent lands and its associated natural resources; however, no indirect or direct impacts are anticipated. The addition of land for Refuge hunts would result in a net gain of public hunting opportunities positively impacting the general public, nearby residents, and Refuge visitors. The Refuge expects increased visitation and tourism to bring additional revenues to local communities but not a significant increase in overall revenue in any area. Through these direct and indirect economic impacts, community support has increased significantly for Refuge land acquisition and public use opportunity funding.

Additionally, traditional uses such as hunting have been a way of life for rural communities around the Refuge, often occurring on lands that are now part of the Refuge. In recent years land use changes around the Refuge have eliminated many areas that have been traditionally leased by hunters. Commercial timber lands have been sold to residential developers and the interest in public lands in upper coastal South Carolina has increased significantly since the establishment of the Refuge. By opening newly acquired or leased Refuge Tracts to limited hunting, new opportunities would be gained for continuing a traditional use and consequently it would have a positive economic impact on these rural communities.

4.3.4 Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, when viewed as a whole, become substantial over time. The proposed action has been fully evaluated and by design is sustainable through time given relatively stable conditions.

4.3.5 Anticipated Impacts if Individual Hunts are allowed to Accumulate

All NWR's must conduct hunting programs within the framework of state and Federal regulations. In most cases, Waccamaw NWR is more restrictive than most of the State Wildlife Management Areas (WMA) on similar habitats. By maintaining hunting regulations that are more restrictive than the State regulation on private lands and/or State

WMAs, individual NWR's ensure that a better diversity of management options exist upon the landscape. The proposed 2012 Hunt Plan has been reviewed and is supported by the State. Additionally, South Carolina NWR's coordinate with State annually to maintain regulations and programs that are consistent with the State management program.

Chapter 5: List of Preparers

Craig Sasser, Refuge Manager, U.S. Fish and Wildlife Service, Waccamaw National Wildlife Refuge

Jason Hunnicutt, Visitor Services Manager, U.S. Fish & Wildlife Service, Waccamaw National Wildlife Refuge

Deborah Jerome, Visitor Services Specialist, U.S. Fish & Wildlife Service, Regional Office – Atlanta, GA

Chapter 6: Consultation and Coordination with Others

The South Carolina Department of Natural Resources concurs and fully supports the regulated consumptive public use of the natural resources associated with the Refuge (Refer to Letters of Concurrence). Furthermore, the long-term lease agreement between the State and the USFWS for the incorporation of the Bucksport WMA into the NWRS as part of the Refuge requires that there be no net loss of hunting opportunities. The USFWS also provided an in depth review by its regional office personnel and staff biologists. Numerous contacts were made throughout the area of the Refuge soliciting comments, views, and ideas into the development of the accompanying 2012 Hunt Plan.

Appendix A: Literature References

- Aulbach-Smith, C. 1993 (unpubl.). Natural plant communities of Sandy Island. Report submitted to Winyah Bay Focus Area Task Force, March 3, 1993. Winyah Bay Focus Area Task Force, Georgetown, South Carolina. 4pp.
- Barett, R.H. 1978. The feral hog on the Dye Creek Ranch, California. *Hilgardia* 46:283-355.
- Behrend, D.F., G.F. Mattfeld, W.N. Tierson and F.E. Wiley, III. 1976. Deer density control for comprehensive forest management. *J. For.* 68:695 - 700.
- Bridges, R.J. 1968. Individual white-tailed deer movement and related behavior during the winter and spring in northwestern Florida. M.S. Thesis. Univ. of Georgia, Athens. 86pp.
- Cape Romain National Wildlife Refuge annual narrative. 2002 (unpubl.). Awendaw, South Carolina.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31, U.S. Department of Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C. 131 pp.
- Cronan, J.M., Jr. 1957. Food and feeding habitats of the scaups in Connecticut waters. *Auk* 74:459-468.
- Dickinson, N.R. 1983. An example of the effect of underharvesting on a deer population. *N.Y. Fish and Game J.* Vol.30, pp 231-232.
- Ellingwood, M.R. and S.L. Caturano. 1988. An evaluation of deer management options. The New England Chapter of the Wildlife Society. The Northeast Deer Technical Committee. Publ. No. DR-11. 13pp.
- Everett, D.D., Jr. 1982. Factors limiting populations of wild turkeys on state wildlife management areas in North America. Ph.D. Dissertation. Audubon University. 135pp.
- Frost, C.C. 1993. Four centuries of changing landscape patterns in the longleaf pine ecosystems. Pages 17-43 in S.M. Hermann, ed., *Proceedings of the Tall Timbers Fire Ecology Conference, No.18, The Longleaf Pine Ecosystem: Ecology, Restoration, and Management*. Tall Timbers Research Station, Tallahassee, Florida.
- Gordon, D.H., B.T. Gray, R.D. Perry, M.B. Prevost, T.H. Strange and R.K. Williams. 1989. South Atlantic Coastal Wetlands. 57-92pp in L.M. Smith, Ed. *Habitat*

- 1990 Management for Migrating and Wintering Waterfowl in North America Texas Tech. University Press, Lubbock, TX.
- Hesselton, W.T., C.W. Severinghaus and J.E. Tank. 1965. Population dynamics of deer at the Seneca Army Depot. N.Y. Fish and Game J. Vol. 12:17-30.
- Kirby, R.E., J.E. Hines and J.D. Nichols. 1983. Afternoon closure of hunting and Recovery rates of mallards banded in Minnesota. J. Wildl. Manage. 47:209-211.
- McCullough, D.R. 1979. The George Reserve deer herd: population ecology of a K-selected species. Ann Arbor. Univ. Michigan Press. 271pp.
- McNeil, R., P. Drapeau and J. D. Goss-Custard. 1992. The occurrence and adaptive significance of nocturnal habits in waterfowl. Biol. Rev. 67:381- 419.
- Mosby, H.S. 1969. The influence of hunting on the population of a woodlot grey squirrel population. J. Wildl. Manage. 33 (1) : 59-73.
- Noss, Reed F. and Allen Cooperrider. 1994. *Saving Nature's Legacy*. Island Press, Washington, D.C. 416 pp.
- Palmer, D.T., D.A. Andrews, R.O. Winters and J.W. Francis. 1980. Removal techniques to control an enclosed deer herd. wildl. soc. Bull. 8 (1) : 29-33.
- Paulus, S.L. 1984. Activity budgets of nonbreeding gadwalls in Louisiana. J. Wildl. Manage. 48:371-380.
- Rose, G.B. 1984. Mortality rates of tagged adult cottontail rabbits. J. Wildl. Manage. 41 (3) : 511-514.
- Sanderson, G.C. 1966. The Study of mammal movement – a review. J. Wildl. Manage. 30(1):215-235.
- Smith, F.H., Jr. 1970. Daily and seasonal variation in movements of white-tailed deer on Elgin Air Force Base, Florida. M.S. Thesis. Univ. of Georgia, Athens. 58pp.
- South Carolina Department of Natural Resources. 2010. South Carolina Deer Harvest Report. Deer Research & Management Project, Columbia, South Carolina, 31pp.
- Sweeney, J.M. 1970. Preliminary investigation of feral hog (*Sus scrofa*) population on the Savannah River Plant, SC. M.S. Thesis, Univ. Georgia, Athens. 58pp.
- U.S. Fish and Wildlife Service. 1992b. Endangered and threatened species of the southeastern United States (Red Book). U.S. Department of the Interior, Fish and Wildlife Service, Office of Ecological Services, Division of Endangered Species, Atlanta, Georgia. 1,242pp.

U.S. Fish and Wildlife Service. 1997. Final Environmental Impact Statement for the Proposed Establishment of Waccamaw National Wildlife Refuge. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Regional Office, Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2005. Waterfowl harvest and population survey data: Estimates of U.S. harvest, hunting activity, and success derived from the state-federal cooperative harvest information program. Division of Migratory Bird Management, Columbia, Missouri, 92 pp.

U.S. Fish and Wildlife Service. 2006. Waterfowl population status, 2006. Division of Migratory Bird Management, Laurel, Maryland, 60 pp.

U.S. Fish and Wildlife Service. 2011. Migratory bird hunting activity and harvest during the 2009 and 2010 hunting seasons. Division of Migratory Bird Management, Laurel, Maryland, 68pp.

U.S. Fish and Wildlife Service. 2008. Waccamaw National Wildlife Comprehensive Conservation Plan. Department of the Interior, Fish and Wildlife Service, Southeast Regional Office, Atlanta, Georgia.

Winyah Bay Focus Area Task Force. 1994 (unpubl.) Draft project plan: Winyah Bay Focus Area, an Atlantic Coast Joint Venture project of the North American Waterfowl Management Plan. Winyah Bay Focus Area Task Force, Georgetown, South Carolina. 18pp.

Personal Communications

Mary K. Clark, North Carolina State Museum of Natural Sciences, Raleigh, North Carolina.

Tom Murphy, 2003. South Carolina Department of Natural Resources, Charleston, South Carolina.

Appendix B: Response to Public Comments

Waccamaw NWR sent out a press release on 12/29/2011 announcing the availability of the Draft Environmental Assessment and Draft 2012 Hunt Plan. The public comment period ran through January 20, 2012. A public “open house” was held at the Refuge Headquarters on January 18, 2012. Written comments were provided the South Carolina Department of Natural Resources and one other members of the general public. A voice mail message was also received.

SCDNR Comments

Page 11 – Under “Small Game” you list coyotes as a species that does not occur in adequate numbers to support hunting them on the Refuge. Since coyotes exist in every county in the state and are causing issues in some areas of the state, we do not think coyotes should be listed within a list of species that “do not occur in adequate numbers on the Refuge”. SCDNR encourages hunters to harvest coyotes; therefore we suggest you allow for the harvest of coyotes to occur while legally hunting other game species.

FWS Response – The staff and funding are not currently sufficient to conduct a coyote population density survey and therefore is not opening a coyote hunting season on the Refuge. Furthermore, coyote scat observations indicate that they are predating young feral hogs on the Refuge and due to the severity of the increasing feral hog infestation the predatory role of the coyote needs to be assessed and evaluated as an additional management tool.

Page 13 – Under C “Species to be Hunted” you list feral hogs as a big game species. They should be listed separate from big game species since feral hogs are not designated as big game in SC Law. According to Statute 50-11-300 “Big game species are white-tailed deer, turkey, and black bear.” We would also recommend that feral hogs be allowed to be harvested during any open hunting season with weapons that are legal for the particular season that is open. In other words, harvest hogs at every opportunity available.

FWS Response – The Refuge lists feral hogs as Big Game Species only for the purpose of Refuge Specific regulations for designated hunts. The Refuge Hunt Plan has added language to the plan that identifies feral hogs as an invasive species not recognized by SCDNR as a Big Game Species. The Refuge cannot open feral hog hunting for all Refuge Hunts due to weapon restrictions and the Refuge Policy that requires hunters to shoot hogs from an elevated stand.

Page 15 – Under B (Weapons Section) you list crossbows as prohibited equipment. SC Statute 50-11-565 states “archery equipment means a bow and arrow, a long bow, a recurve bow, a compound bow, or a crossbow.” On SCDNR Wildlife Management Areas, crossbows can be used anytime archery equipment can be used.

FWS Response - The Refuge has added crossbows to the list of allowed weapons. Because most crossbows use a scope which allows for enhanced vision particularly during low light conditions, the use of crossbows will be allowed during the muzzleloader season instead of during the archery season.

Page 17 – Under the “Dog” section you need to include “opossum” in the list of species that can be hunted by use of dogs.

FWS Response – The Refuge has added opossum to the list of species that can be hunted by use of dogs.

Page 18 - Under the “hunter Orange” section we suggest you list feral hogs separately and not as a big game species.

FWS Response – The Refuge lists feral hogs as Big Game Species only for the purpose of Refuge Specific regulations for designated hunts. The Refuge Hunt Plan has added language to the plan that identifies feral hogs as an invasive species not recognized by SCDNR as a Big Game Species. The Refuge cannot open feral hog hunting for all Refuge Hunts due to weapon restrictions and the Refuge Policy that requires hunters to shoot hogs from an elevated stand.

Page 20 – Under the “Allowable Equipment “ section, the 3rd sentence should also list feral hogs as a species that can be hunted with dogs.

FWS Response – The Refuge has added feral hogs that can be hunted with dogs under special hunt.

Other Comments

Comment - Manage your hunts like Wee Tee Wildlife Management Area.

FWS Response – Although very similar in overall hunting allowances, Waccamaw NWR offers longer archery seasons and a muzzleloader season prior to the modern weapon hunts. The Refuge also has three different units and limited staff resources so generally the hunts in one unit will not fall on the dates of another unit’s hunt thus allowing the Refuge to adequately manage the hunt.

Comment – If it is a “Refuge”, why are you allowing hunting at all on the Refuge. I think a Refuge should be a “Refuge” and the hunters should not be able to hunt them for pleasure.

FWS Response - Thank you for your concern and your comment. Hunting is a legitimate wildlife management tool on wildlands in general and National Wildlife Refuges in particular. Its dual benefits are as a form of outdoor recreation and as a means of controlling populations of target species. The National Wildlife Refuge System Improvement Act of 1997 explicitly identifies hunting as one of the public uses generally

compatible with the purposes of National Wildlife Refuges, and Waccamaw NWR is no exception. A compatibility determination for hunting was prepared in 2008 during the Waccamaw NWR Comprehensive Conservation Plan and has been updated and is included in this Environmental Assessment.

Recreational Hunting
Decision Document Package
for
WACCAMAW NWR

Contents

3. FONSI

FINDING OF NO SIGNIFICANT IMPACT

2012 Recreational Hunting Plan Addendum for Waccamaw National Wildlife Refuge

The U.S. Fish and Wildlife Service (USFWS) proposes to open all newly acquired or leased tracts and future acquisitions or leases to hunting on Waccamaw NWR. Hunting activities will be permitted on these new Refuge lands, but administratively limited to those areas specified in the refuge-specific regulations. All or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for other reasons. The USFWS also proposes to open woodcock hunting for the first time on lands owned or future lands acquired that are also designated as waterfowl hunting areas. Alternatives considered included: no action and the proposed action .

The Service has analyzed the following alternatives to the proposal in an Environmental Assessment (copy attached):

No action alternative - Under this alternative, the Service would not open newly acquired or leased tracts that have been added to the Refuge, to any form of hunting.

Limited Hunting Alternative (Proposed action) -Under this alternative, the Service would allow limited public hunting of migratory game birds and resident game species on 26,850 acres of Waccamaw NWR as well as any newly acquired tracts in the future.

The preferred alternative was selected over the other alternatives because:

1. The preferred alternative would allow the refuge to manage wildlife populations, allow the public to harvest a renewable resource, promote a wildlife-oriented recreational opportunity, increase awareness of Waccamaw NWR and the National Wildlife Refuge System, and meet public demand on all newly acquired or leased Refuge tracts including those recently added to the Refuge management.
2. The preferred alternative allows the Refuge to meet all of the lease requirements between the USFWS and the South Carolina Department of Natural Resources for the addition of Bucksport WMA. It would also allow Waccamaw NWR to meet the lease commitments to Brookgreen Gardens and The Nature Conservancy within Unit 2.
3. The preferred alternative is compatible with general Service policy regarding the establishment of hunting on National Wildlife Refuges.

4. The preferred alternative is compatible with the purpose for which Waccamaw NWR was established.
5. This proposal does not initiate widespread controversy or litigation.
6. There are no conflicts with local, state, regional, or federal plans or policies.

Implementation of the agency's decision would be expected to result in the following environmental, social, and economic effects:

1. The Refuge could better manage wildlife populations.
2. This would allow the public to harvest a renewable resource.
3. The public would have increased opportunity for wildlife-oriented recreation.
4. Local businesses would benefit from hunters visiting from surrounding counties and states.
5. The Service will be perceived as a good steward of the land by continuing traditional uses of land in South Carolina and by allowing youth an opportunity to learn about hunting.

Measures to mitigate and/or minimize adverse effects have been incorporated into the proposal. These measures include:

1. Youth turkey hunts will be in a limited area of the Refuge.
2. Baiting for any wildlife will be prohibited. Deer hunting will be limited to two week intervals beginning with an emphasis on archery and muzzle loader hunts. The overall duration of all hunts will be reduced considerably from the corresponding state seasons.
3. Waterfowl hunting will be limited to 12:00 noon Saturdays & Wednesdays only.
4. Woodcock hunting will only be allowed in areas that are open to waterfowl hunting to minimize additional disturbance.
5. The Refuge law enforcement program and closely regulated hunting season will ensure hunt regulation compliance and will protect Refuge resources.

The proposal is not expected to have any significant adverse effects on wetlands and flood plains, pursuant to Executive Orders 11990 and 11988 because this area has historically had a high use of recreational hunting with no detrimental long-term effect on wetlands.

The proposal has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include:

§ U.S. Fish and Wildlife Service, Division of Ecological Services, Charleston,
SC
§ South Carolina Department of Natural resources, Chief of Wildlife Division

Copies of the Environmental Assessment are available by writing:

Waccamaw National Wildlife Refuge
PO Box 1439
Georgetown, SC 29440




Therefore, it is my determination that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environment Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):

- 1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment (EA, page 24,38,39)**
- 2. The actions will not have a significant effect on public health and safety (EA, page 24).**
- 3. The proposed project will not significantly effect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas (EA, page 9).**
- 4. The actions will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration (EA, pages 40).**
- 7. There will be no cumulative significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions (EA, page 39).**
- 8. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources (EA, pages 19,25,39).**
- 9. The actions are not likely to adversely affect endangered or threatened species, or their habitats (Intra-Service Section 7 Biological Evaluation Form attached to EA).**

10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment (EA, page 3).

References: Environmental Assessment of 2012 Recreational Hunt Plan for Waccamaw NWR, Hunting Plan, Compatibility Determination, Letters of Concurrence, Refuge-specific Regulations, Intra-Service Section 7 Evaluation, and Outreach Plan.

Decision Tree

Submitted by:		<u>1/26/2012</u>
	Marshall "Craig" Sasser Jr., Refuge Manager	Date
Concur:		<u>02/22/2012</u>
	Pete Jerome, Area 3 Supervisor	Date
		<u>3/8/12</u>
	Cindy Dohner, Regional Director	Date

Recreational Hunting
Decision Document Package
for
Waccamaw NWR

Contents

4. Compatibility Determination

COMPATIBILITY DETERMINATIONS

Introduction: The Fish and Wildlife Service reviewed hunting for compatibility during the opening package for the recreational hunting program on Waccamaw National Wildlife Refuge. Descriptions and anticipated impacts of each use are addressed separately. However, the Uses through National Wildlife Refuge System Mission, and the Approval of Compatibility Determinations section apply to each use.

Uses: Recreational hunting of big game, small game, and migratory birds

Refuge Name: Waccamaw National Wildlife Refuge

County: Georgetown, Horry, and Marion Counties, South Carolina

Establishing and Acquisition Authority: Migratory Bird Conservation Act of 1929 and the Emergency Wetland Resources Act of 1986 (100 Stat.3582-91).

Refuge Purpose(s): The primary purposes for Waccamaw NWR are: (1) protect and manage diverse habitat components within an important coastal ecosystem for the benefit of threatened and endangered species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and (2) provide compatible wildlife-dependent recreational activities, including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation for the enjoyment of present and future generations (U.S. Fish and Wildlife Service, Waccamaw NWR FEIS April 1997).

National Wildlife Refuge System Mission: "The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended) [16 U.S.C. §668dd-668ee].

Description of Use:

Big Game Hunting

Big game hunting on Waccamaw NWR consists of white-tailed deer, feral hogs, and limited youth turkey hunts. The South Carolina Department of Natural Resources does not classify feral hogs as a big game species, however the Refuge does for the purpose of its hunting program's rules and regulations. Hunting activities are permitted with a valid Refuge hunt permit and appropriate state licenses. The Refuge hunt program is an excellent wildlife management and public relations tool, which provides quality recreational opportunities for the public while regulating specific animal populations at desired levels. The Refuge hunt plan was developed to ensure that associated public

recreation and wildlife management objectives are met in a responsible and consistent manner.

Hunting, a wildlife-dependent recreation, has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use provided it is compatible with the purpose for which the Refuge was established.

Hunting can occur on any portion of the Refuge; however, all or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons. All hunting seasons are established annually through coordination with the South Carolina Department of Natural Resources. All regulations and annual changes are published in the Code of Federal Regulations (50 CFR).

Hunters access the Refuge by foot only.

Public hunting opportunities are limited in South Carolina. Hunting opportunities on private land are virtually non-existent unless a person is willing and able to purchase hunting rights through hunting leases.

Cumulative impacts of Use:

Deer and turkey hunting has been occurring on lands adjacent to the Refuge for many years using much more liberal seasons than the Refuge would stipulate. Data from the South Carolina Department of Natural Resources indicate stable populations of both species. Therefore, hunting on Waccamaw NWR with a more restricted season and regulations should not have negative cumulative impacts on deer and turkey populations.

Since hogs are exotic, they are not a priority species in Refuge management considerations. Feral hogs are considered a threat to the biological integrity of the Refuge and reducing their numbers is a priority for Refuge management. Cumulative negative impacts on hog populations are desired; however, because they are prolific breeders, it is likely the Refuge will always have a hog population in the future.

Determination (check one below):

☐ Use is Not Compatible

☒ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Hunting seasons and bag limits are established annually as agreed upon during the annual hunt coordination meeting with state personnel. These seasons fall within the state framework. The Refuge has consistently established more restrictive seasons and bag limits to prevent over-harvest of individual species or disturbance to trust species. All

hunters are required to possess a Refuge hunting permit while participating in Refuge hunts. This permit, which augments the state hunting regulations, explains both the general hunt regulations and the refuge-specific regulations. Law enforcement patrols are frequently conducted throughout the hunting season to ensure compliance with Refuge laws and regulations.

Justification:

Deer

Deer hunts have proven to be not only compatible with Refuge objectives but also beneficial in meeting them. Deer harvest is essential to help maintain the herd at or below habitat carrying capacity. Overpopulated deer leads to starvation, disease outbreak, and die-off, and to major alteration of native habitats by overbrowsing.

Deer herd health checks are conducted on most NWR's by the Southeast Cooperative Wildlife Disease Study at the University of Georgia. In 2005, the health check report for Waccamaw NWR stated that "Although continuation of current herd density may result in declines in herd health or higher rates of disease-induced mortality, the data suggests that some level of covert mortality may be present. These losses will predominantly affect younger animals, 4-12 month of age, mainly during winter and early spring, and will be associated with parasitism by stomach worms (*Haemonchus contortus*) and lungworms (*Dictyocaulus viviparus*). Any significant increase in density likely would result in declines in population health from this density-dependent parasitism/malnutrition syndrome."

Harvest and survey data collected by the South Carolina Department of Natural Resources in 2010 confirm that decades of deer hunting on surrounding private lands (using bait and a longer season) have not had a local cumulative adverse effect on the deer population. The State estimates that 222,649 deer were harvested in South Carolina in 2010. Harvest records by each county indicate that Georgetown County harvested 4,741 deer in 2010. This total harvest also computes to 84.3 acres/deer or 7.6 deer/square mile. For Horry County, 4,613 deer were harvested in 2010 which also computes to 115.6 acres/deer or 5.5 deer/square mile. Harvest rates on Refuge lands have been significantly lower than private lands adjoining the Refuge due to the allowance of baiting, longer seasons and no restrictions of method of take on private lands.

Deer hunting also provides wildlife-dependent recreation to the public in a region where these opportunities are vanishing. The vast majority of private land is leased for hunting, often costing a person \$300-\$2000/year for membership. The Refuge often attracts those hunters who cannot afford to join a hunting club.

Feral Hogs

Feral hogs are an introduced, non-native species that is extremely invasive. They can harbor several infectious diseases, some of which can be fatal to wildlife. By rooting and

wallowing, feral hogs destroy habitat that wildlife depend on. Destruction includes erosion along waterways and wetlands and the loss of native plants. Additionally, feral hogs compete directly for food with deer, bears, turkeys, squirrels and many other birds and mammals. They are predators of small mammals and deer fawns as well as ground-nesting birds such as turkeys. Hunting of feral hogs provides the Refuge with another management tool in reducing this detrimental species, and at the same time, is widely enjoyed by local hunters.

Wild Turkey

Turkey hunting on the Refuge is decided upon annually based on available habitat and when offered, is limited to youths hunts during the spring. The hunting area is confined to a small section of bottomlands on the western side of the Refuge. Turkeys are non-migratory and therefore hunting only impacts the local population. Because Refuge turkey hunting would be restricted to Refuge tracts along the Great Pee Dee River, frequent flooding along with many other environmental circumstances often further impedes hunter success. Based on harvest data from six South Carolina Department of Natural Resources youth turkey hunts, the overall harvest rates were less than 40% unless accompanied by a professional guide (personal communications with SCDNR Biologist). These data indicate that the local turkey population has withstood hunting on surrounding private lands for several years without negative cumulative effects on turkeys. Therefore, the Refuge should not cumulatively adversely impact the population.

NEPA Compliance for Refuge Use Description:

- ☐ Categorical Exclusion without Environmental Action Statement
- ☐ Categorical Exclusion and Environmental Action Statement
- ☒ Environmental Assessment and Finding of No Significant Impact
- ☐ Environmental Impact Statement and Record of Decision

Mandatory 15-Year Re-evaluation Date: 2027

Description of Use:

Small Game Hunting

Small game hunting consists of squirrels, raccoons, & opossum. Hunting activities are permitted with a valid Refuge hunt permit and appropriate state licenses. The Refuge hunt program is an excellent wildlife management and public relations tool, which provides quality recreational opportunities for the public while regulating specific animal populations at desired levels. The Refuge hunt plan was developed to ensure that associated public recreation and wildlife management objectives are met in a responsible and consistent manner.

Hunting, a wildlife-dependent recreation, has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use provided

it is compatible with the purpose for which the Refuge was established.

Hunting can occur on any portion of the Refuge; however, all or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons. All hunting seasons are established annually through coordination with the South Carolina Department of Natural Resources. All regulations and annual changes are published in the Code of Federal Regulations (50 CFR).

Hunters access the Refuge by foot only.

Public hunting opportunities are limited in South Carolina. Hunting opportunities on private land are virtually non-existent unless a person is willing and able to purchase hunting rights through hunting leases.

Cumulative impacts of Use:

Opossum and raccoon are hunted primarily at night. Raccoon are more sought after than opossum by the public. Hunting helps regulate opossum and raccoon populations; however, unless the popularity of this type of hunting increases, raccoons and opossums numbers will always be higher than desired. When these species become extremely overabundant, diseases such as distemper and rabies reduce the populations. However, waiting for disease outbreak to regulate their numbers can be a human health hazard. Cumulative adverse impacts to raccoon and opossum are unlikely considering they reproduce quickly, are difficult to hunt due to their nocturnal habits, and are not as popular for hunting as other game species.

Determination (check one below):

☐ Use is Not Compatible

☒ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Hunting seasons and bag limits are established annually as agreed upon during the annual hunt coordination meeting with state personnel. These generally fall within the state framework. The Refuge could, and has, established more restrictive seasons and bag limits to prevent over-harvest of individual species or disturbance to trust species. All hunters are required to possess a Refuge hunting permit while participating in Refuge hunts. This permit, which augments the state hunting regulations, explains both the general hunt regulations and the refuge-specific regulations. Law enforcement patrols are frequently conducted throughout the hunting season to ensure compliance with Refuge laws and regulations.

Justification:

Overpopulation of raccoons and opossum causes abnormally high rates of depredation on turkey and songbird nests. Hunting of these two species would help reduce raccoon and opossum numbers. Studies have been conducted within and outside of South Carolina to determine the effects of hunting on the population dynamics of small game. Results from studies have consistently shown that small game, such as squirrels, are not affected by hunting, but rather are limited by food resources. Refuge staff consulted with State biologists in association with this assessment on the cumulative impacts of hunting squirrel, raccoons and opossum. Although overall State harvest data was unavailable for South Carolina for these species, the Refuge hunt program is not expected to have any significant impact even on local populations of these species due to limited Refuge access and frequent flood events. Under the proposed action, the Refuge estimates a maximum additional 50 squirrels would be harvested and 65 raccoons. Gray squirrels are prolific breeders and their populations have never been threatened by hunting in South Carolina even prior to the passing of hunting regulations as we know them today.

NEPA Compliance for Refuge Use Description:

- ☐ Categorical Exclusion without Environmental Action Statement
- ☐ Categorical Exclusion and Environmental Action Statement
- ☒ Environmental Assessment and Finding of No Significant Impact
- ☐ Environmental Impact Statement and Record of Decision

Mandatory 15-Year Re-evaluation Date: 2027

Description of Use:*Migratory Bird Hunting*

Migratory bird hunting on Waccamaw NWR consists of ducks, snipe, woodcock, & geese. Hunting activities are permitted with a valid Refuge hunt permit and appropriate state licenses. The Refuge hunt program is an excellent wildlife management and public relations tool, which provides quality recreational opportunities for the public while regulating specific animal populations at desired levels. The Refuge hunt plan was developed to ensure that associated public recreation and wildlife management objectives are met in a responsible and consistent manner.

Hunting, a wildlife-dependent recreation, has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use provided it is compatible with the purpose for which the Refuge was established.

Hunting can occur on any portion of the Refuge; however, all or parts of the Refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons. All hunting seasons are established annually

through coordination with the South Carolina Department of Natural Resources. All regulations and annual changes are published in the Code of Federal Regulations (50 CFR).

Hunters access the Refuge by foot only.

Public hunting opportunities are limited in South Carolina. Hunting opportunities on private land are virtually non-existent unless a person is willing and able to purchase hunting rights through hunting leases.

Cumulative impacts of Use:

Regulated hunting does not have an adverse impact on populations of migratory birds. Hunting is a priority public use and offers the public an inexpensive wildlife-dependent recreational opportunity. The USFWS, working with partners, annually prescribe frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow State selections of season and limits for recreation and sustenance; aid Federal, State, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the USFWS annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which States may select season dates, bag limits, shooting hours, and other options for each of the migratory bird hunting seasons. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

Determination (check one below):

☐ Use is Not Compatible

☒ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Hunting seasons and bag limits are established annually as agreed upon during the annual hunt coordination meeting with state personnel. These generally fall within the state framework. The Refuge could, and has, established more restrictive seasons and bag limits to prevent over-harvest of individual species or disturbance to trust species. All hunters are required to possess a Refuge hunting permit while participating in Refuge hunts. This permit, which augments the state hunting regulations, explains both the general hunt regulations and the Refuge-specific regulations. Law enforcement patrols are frequently conducted throughout the hunting season to ensure compliance with Refuge laws and regulations.

Justification:Waterfowl

Waterfowl hunts are restricted to two half days per week only on Refuge lands along the Great Pee Dee River and only allowed until noon throughout the state waterfowl season. As a result of this restrictive framework, annual waterfowl harvest estimates is anticipated to be on average, approximately 25 additional wood ducks harvested each year on the Refuge managed hunts. This harvest impact represents a mere 0.001% of South Carolina's four-year average harvest of 80,440 wood ducks (USFWS, 2006). Additionally, the Refuge has created a contiguous 12,323 acre waterfowl sanctuary along the Waccamaw River sections of the refuge. This area is becoming an important habitat resource for wintering a significant proportion of the wintering wood duck population in an area of the Refuge where State or private sanctuaries have not existed before.

Woodcock

Although wintering numbers fluctuate depending on weather and soil moisture, these areas consistently held huntable populations of woodcocks. Furthermore, in a study done by U.S. Geological Patuxent Wildlife Research Center in 2005 (McAuley *et al.* 2005), study results showed no significant differences in woodcock survival between hunted and non-hunted areas.

Snipe

Based on the USFWS Harvest Report for 2011, snipe harvest estimates for South Carolina for 2009 and 2010 were 1,900 and 7,400 respectively. Seasonal harvest in SC per hunter was 1.6 in 2009 and 5.2 in 2010. Total harvest of snipe for the Atlantic Flyway was 43,600 in 2009 and 54,000 in 2010. Although flyway harvest did not vary significantly between 2009 and 2010, seasonal harvest variations for South Carolina did which demonstrates how weather may be a significant factor in hunter success throughout the state. Based on hunters interviewed during refuge hunts, the overall harvest for Waccamaw NWR will be on average approximately 20 birds per year.

NEPA Compliance for Refuge Use Description:

- ☐ Categorical Exclusion without Environmental Action Statement
- ☐ Categorical Exclusion and Environmental Action Statement
- ☒ Environmental Assessment and Finding of No Significant Impact
- ☐ Environmental Impact Statement and Record of Decision

Mandatory 15-Year Re-evaluation Date: 2027

Availability of Resources for Uses:

Operation and maintenance funds to support hunting are taken from the Refuge's annual budget, which is adequate to sustain the program at the current level. Costs to administer the hunt program will be primarily staff salaries. The facilities most utilized by hunters are parking lots and boat launching ramps. Because hunters are permitted to access the Refuge by foot only, no additional maintenance or improvements of existing facilities will be required. It is estimated that the following annual level of involvement by Refuge staff will be required to adequately manage and monitor the additions to the hunt program over the long term:

Position and GS Level	Involvement	FTE	Cost (approx.)
Refuge Manager GS-12	Oversight, Hunt Plan Development/Updates, Coordination Meetings with SCDNR	.10	\$10,000
Assistant Manager GS-11	Monitor, report, dual function law enforcement	.15	\$12,500
Visitor Services Manager GS-9	Monitor, Hunt Plan Development/Updates, Hunt Brochure Development/Updates/Mailings, Maps	.25	\$12,500
Law Enforcement GS-9	Conduct law enforcement and compliance checks	.25	\$12,500
Total Annual FTE's and Costs		.75	\$47,500

Anticipated Impacts of the Uses:

Short-term impacts:

Anticipated impacts were identified and evaluated based on best professional judgment and published scientific papers. Waccamaw NWR has been open to hunting for almost two decades, with no documented disturbance to Refuge habitats and no noticeable impact on the abundance of species hunted or other associated wildlife. While managed hunting opportunities may result in localized disruption of individual animals' daily routines, no noticeable effect on populations has been documented. Refuge hunting is a well monitored and regulated public use and this activity should not have a negative impact on the overall Refuge populations of the game species approved for hunting.

Long-term impacts:

To date, there is no indication of adverse biological impacts associated with the Refuge's hunting program. However, should it become necessary, the Refuge has the latitude to adjust hunting seasons and bag limits annually, or to close the Refuge entirely if there are safety issues or other concerns that merit closure identified. This latitude, coupled with monitoring of wildlife populations and habitat conditions by the Service and the South

Carolina Department of Natural Resources, would ensure that long-term negative impacts to either wildlife populations and/or habitats on the Refuge are unlikely.

Should hunting pressure increase on the Refuge, alternatives such as quota hunts, a reduction in the number of days of hunting, or restrictions on that part of the Refuge open to hunting could be utilized to limit impacts.


Public Review and Comment:

This compatibility determination is part of the 2012 Recreational Hunting Plan and Environmental Assessment for Waccamaw National Wildlife Refuge and was made available for public comment for 30 days beginning February 1st, 2012. The request for public comments was published in The Georgetown Times on February 1st, 2012 and in The Horry Independent on February 2nd, 2012. It was also published on the website for The Sun News at www.myrtlebeachonline.com on February 2nd, 2012. This document was on display at the Refuge Visitor Center for review during the 30-day period. No public comments were received. This document is submitted for Fish and Wildlife Service final approval.

Approval of Compatibility Determinations

The signature of approval is for all compatibility determinations considered within the 2012 Recreational Hunting Plan for Waccamaw NWR. If one of the descriptive uses is considered for compatibility outside of the plan, the approval signature becomes part of that determination.

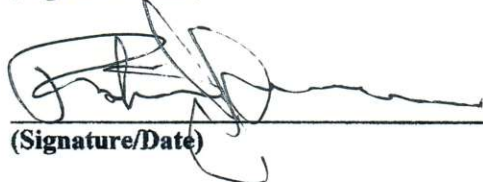
Refuge Manager:

 2/29/2012
Marshall Craig Sasser (Signature/Date)

Regional Compatibility
Coordinator:

 2/29/2012
(Signature/Date)

Refuge Supervisor:

 2/29/2012
(Signature/Date)

Regional Chief, National
Wildlife Refuge System,
Southeast Region

 3/8/2012
Acting (Signature/Date)

Recreational Hunting
Decision Document Package
for
Waccamaw NWR

Contents

5. Intra-service Section 7 Biological Evaluation

**SOUTHEAST REGION
INTRA-SERVICE SECTION 7
BIOLOGICAL EVALUATION FORM**

[Federally endangered, threatened, and candidate species]

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

Originating Person: M. Craig Sasser

Telephone Number: 843-527-8069 **E-Mail:** marshall_sasser@fws.gov

Date: December 15, 2011

PROJECT NAME (Grant Title/Number): 2011 Recreational Hunting Plan for Waccamaw National Wildlife Refuge

I. Service Program:

- ☐ Ecological Services
- ☐ Federal Aid
 - ☐ Clean Vessel Act
 - ☐ Coastal Wetlands
 - ☐ Endangered Species Section 6
 - ☐ Partners for Fish and Wildlife
 - ☐ Sport Fish Restoration
 - ☐ Wildlife Restoration
- ☐ Fisheries
- ☒ Refuges/Wildlife

II. State/Agency: South Carolina

III. Station Name: Waccamaw NWR

IV. Description of Proposed Action (attach additional pages as needed):

Current regulations allow for the hunting of most state listed game species including migratory birds, deer, small game and hogs. Waterfowl are hunted one Wednesday and Saturdays during the State season until noon in portions of Unit 1 along the Great Pee Dee River. Deer are hunted during specific refuge seasons and include an archery, muzzleloader and modern weapon hunt. A feral hog season is opened in the spring after all other seasons are closed.

The refuge is proposing to open all newly acquired tracts and future lands acquired within the approved acquisition boundary to hunting. The refuge is also proposing to open woodcock hunting on Unit 1 only within the waterfowl hunting areas. However, all or parts of the refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for administrative reasons. The proposed action would implement the 2012 Recreational Hunting Plan.

V. Pertinent Species and Habitat:

- A. Include species/habitat occurrence map: See attached map
B. Complete the following table:

Table 1. Listed/proposed species/critical habitat that occur or may occur within the project area:

SPECIES/CRITICAL HABITAT	STATUS
Red-cockaded Woodpecker	E
Wood Stork	E
Shortnose Sturgeon	E
Pondberry	E
Canby's dropwort	E
American chafseed	E
Kirtland's Warbler	E

STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location (attach map):

- A. **Ecoregion Number and Name:** ETP 33-2 Savannah, Santee, Pee Dee Ecosystem
- B. **County and State:** Horry, Georgetown and Marion Counties, SC
- C. **Section, township, and range (or latitude and longitude):**
- D. **Distance (miles) and direction to nearest town:** Between the Great Pee Dee and Waccamaw Rivers in eastern South Carolina, approximately 14 miles southeast of Myrtle Beach, and 12 miles northeast of Georgetown, SC.
- E. **Species/habitat occurrence:** 32 clusters of red cockaded woodpeckers (*Picoides borealis*) were surveyed on Sandy Island in 2011 (see maps). An active wood stork (*Mycteria americana*) rookery is located on private property adjacent to Refuge lands in Unit 1. Shortnose sturgeon are infrequently observed within the Waccamaw NWR Acquisition Boundary.

VII. Determination of Effects:

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Wood stork	Potential human disturbance in feeding areas.
Red Cockaded Woodpecker	Potential human disturbance in nesting and foraging areas.
Shortnose sturgeon	No impacts expected.
Pondberry	No impacts expected.
Canby's dropwort	No impacts expected.
American chaffseed	No impacts expected.
Kirklands Warbler	No impacts expected.

A. Explanation of effects of the action on species and critical habitats in item V. B (attach additional pages as needed):

Red-cockaded woodpeckers (RCW) inhabit a small portion of the Brookgreen Gardens Tract on Sandy Island and this area will be closed to all hunting.

The wood stork rookery is active when all hunting seasons are closed. All other listed species are either not present on the Refuge or will not be affected by any of the proposed actions.

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/ CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Wood stork	See Attachment 1.
RCW	See Attachment 1.

VIII. Effect Determination and Response Requested:

Table 4. The effect determination and response requested for impacts to each proposed/listed species/critical habitat.


SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Wood Stork		X		
RCW		X		
Shortnose Sturgeon	X			
Pondberry	X			
Canby's dropwort	X			
American Chaffseed	X			
Kirklands Warbler	X			

Attachment 1

RECOMMENDATIONS TO AVOID ADVERSE IMPACTS OR ENHANCE SPECIES CONSERVATION:

Wood Stork (*Mycteria americana*): Wood stork use is generally associated with feeding opportunities in areas experiencing either natural or wetland management related drawdowns. By late fall wood storks begin migrating south and use of Refuge feeding habitats is uncommon. Access restrictions will be implemented if any areas are used by wood storks during the hunting seasons. No known nesting rookeries sites presently exist on refuge lands however, if one is established either on or nearby refuge lands, hunting will not be allowed within a one mile radius of the rookery any time during nesting season.

Red-cockaded Woodpecker (*Picoides borealis*): The only RCW habitat within the refuge acquisition boundary is on Sandy Island. A portion of Sandy Island which is owned by Brookgreen Gardens has been added to the Refuge through a long-term lease agreement (see attached map). The remainder of Sandy Island is presently managed by The Nature Conservancy. Hunting on the upland portions of Sandy Island managed by TNC is presently restricted to archery only. The upland portion of Sandy Island now managed by the Refuge is closed to all forms of hunting. The wetland portions surrounding Sandy Island which are part of the Brookgreen Gardens and the TNC lease will be open to deer and hog hunting however this will have no negative impact on upland longleaf pine habitats or RCWs.

 12/29/11
Signature (originating station) date

Refuge Manager
Title

If the project description changes or incidental take exceeds that which has been exempted under section 9 of the Act, then the Ecological Services Field Office must be contacted.

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence ✓ Non-concurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

C. Remarks (attach additional pages as needed):

Paula J. Season 1/9/12
Signature date

Fish and Wildlife Biologist South Carolina
Title office
Field office

04ES1000-2012-I-01a5



Figure 1. Sandy Island red-cockaded woodpecker cavity trees in relation to Brookgreen Garden property in 2011

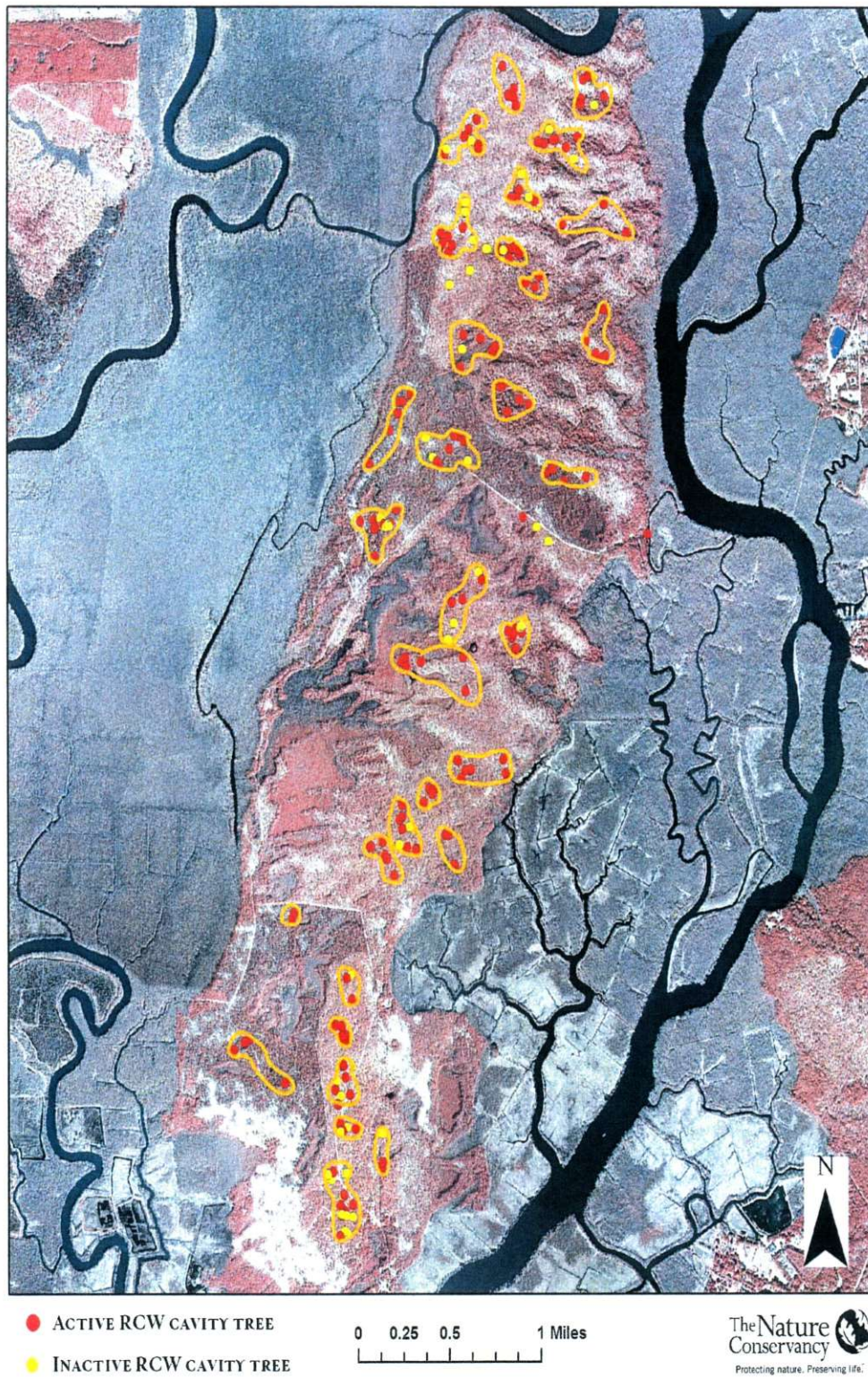


Figure 2. Thirty-two red-cockaded family clusters were estimated on Sandy Island based on arrangement of cavity trees documented in 2011. A more formal field study is needed to be exact.

Recreational Hunting
Decision Document Package
for
Waccamaw NWR

Contents

6. Outreach Plan

OUTREACH PLAN
for
Recreational Hunting Plan, Waccamaw National Wildlife Refuge

Issue: Proposed in a plan to manage the hunting program on the Waccamaw NWR.

Basic Facts About the Issue: Hunting is:

- An important traditional use of the area that is now Waccamaw NWR.
- A popular and important outdoor recreational activity on Waccamaw NWR.
- 1 of 6 of the primary public uses of the National Wildlife Refuge System defined in the refuge Improvement Act of 1997.
- A valuable tool for controlling populations that, if left unchecked, could cause damage to the habitats provided by the refuge (e.g. hunting for deer and feral pigs)

Communication Goals: This plan will inform the public of the proposed hunting program and foster understanding and support for this and other refuge programs.

Message: This proposal provides numerous opportunities for outdoor recreation and provides for control of species that have potential to damage habitats. This proposal also continues and expands traditional uses of renewable resources.

Interested Parties:

- Hunters
- Members of the public that currently use or are new to the refuge including those who will learn about refuge offered opportunities and avail themselves of those opportunities in the future.
- South Carolina Department of Natural Resources

Key Date: January 15, 2012

Materials Needed: Press Releases, Hunting and Fishing Regulations Brochure. The press releases and information for the brochure will be prepared by the Refuge Manager. Brochure information will be submitted to the Southeast Regional Office for publication.

Strategy: A press release was prepared and submitted to area newspapers, radio, and television stations requesting public comments on the 2012 Draft Recreational Hunting Plan. The Georgetown Times published the press release on Wednesday January 4th, 2012. Another press release was prepared and submitted to area newspapers requesting comments on the Compatibility Determination developed for the plan. It was published in the Georgetown Times on February 1st, 2012 and in the Horry Independent on February 2nd, 2012. Additionally, an open house was held at the Refuge to answer any questions regarding the plan. Requests for presentations about the proposed action were also offered.

Action Plan:

Interested Party	Method of Contact	Person Responsible	Phone/Fax	Date of Action
SCDNR	Plan Review <i>Letter</i>	M. Craig Sasser Refuge Manager	(843) 527-8069	12/13/11
General Public	News Release <i>Press List</i>	M. Craig Sasser Refuge Manager	(843) 527-8069	1/03/12
General Public	Open House <i>Waccamaw NWR</i>	M. Craig Sasser Refuge Manager	(843) 527-8069	1/18/12
General Public	News Release <i>Press List</i>	M. Craig Sasser Refuge Manager	(843) 527-8069	2/1/2012



**UNITED STATES DEPARTMENTS
OF THE INTERIOR
WACCAMAW NATIONAL WILDLIFE SERVICE
21424 NORTH FRASER ST.
P.O. BOX 1439
GEORGETOWN, SOUTH CAROLINA 29440
PHONE (843) 527-8069 FAX (843) 527-8494**



December 13, 2011

Mr. Sam Chappellear
South Carolina Department of
Natural Resources
P.O. Box 12559
Charleston SC, 29422

Dear Mr. Chappellear:

Please find enclosed a copy of the Waccamaw National Wildlife Refuge Hunting Package. The Service is signing a NEPA compliance document to open all current and future Refuge lands to hunting. We are required to obtain a letter of concurrence from the State of South Carolina for opening more areas of the refuge. Would your office please provide a letter stating the Department's concurrence with Fish and Wildlife Service's desire to open Waccamaw NWR to additional hunting opportunities? Should you or your staff wish to discuss or have questions please do not hesitate to call me at 843/527-8069. I respectfully request a response by January 20, 2011, if possible.

Sincerely,

M. Craig Sasser
Waccamaw NWR Refuge Manager

South Carolina Department of Natural Resources



DNR

John E. Frampton
Director

Emily C. Cope
Deputy Director for
Wildlife and Freshwater Fisheries

January 11, 2012

Mr. Craig Sasser
Waccamaw Refuge Manager
21424 N. Fraser St.
Georgetown, SC 29440

Dear Craig:

The South Carolina Department of Natural Resources (SCDNR) appreciates the opportunity to comment on the Draft Recreational Hunting Plan for the Waccamaw National Wildlife Refuge.

In general, SCDNR concurs with the overall plan and would encourage you to allow as much recreational hunting to occur as possible; however we do suggest that some changes be made to the plan. Listed below are concerns SCDNR has with the draft as it is currently presented.

Page 11- Under "Small Game" you list coyotes as a species that does not occur in adequate numbers to support hunting them on the Refuge. Since coyotes exist in every county in the state and are causing issues in some areas of the state, we do not think coyotes should be listed within a list of species that "do not occur in adequate numbers on the Refuge". SCDNR encourages hunters to harvest coyotes; therefore we suggest you allow for the harvest of coyotes to occur while legally hunting other games species.

Page 13- Under C "Species to be Hunted" you list feral hogs as a big game species. They should be listed separate from big game species since feral hogs are not designated as big game in SC Law. According to Statute 50-11-300 "Big game species are white-tailed deer, wild turkey, and black bear." We would also recommend that feral hogs be allowed to be harvested during any open hunting season with weapons that are legal for the particular season that is open. In other words, harvest hogs at every opportunity available.

Page 15- Under B (Weapons Section) you list crossbows as prohibited equipment. SC Statute 50-11-565 states "archery equipment means a bow and arrow, a long bow, a recurve bow, a compound bow, or a crossbow." On SCDNR Wildlife Management Areas, crossbows can be used anytime archery equipment can be used.

Page 17- Under the "Dogs" section you need to include "opossum" in the list of species that can be hunted by use of dogs.

Mr. Craig Sasser
January 3, 2012
Page 2

Page 18- Under the "Hunter Orange" section we suggest you list feral hogs separately and not as a big game species.

Page 20- Under the "Allowable Equipment" section, the 3rd sentence should also list feral hogs as a species that can be hunted with dogs.

In conclusion, SCDNR encourages the USF&WS to allow as much recreational hunting to occur as possible along with making every effort to eliminate as many feral hogs from the landscape as possible. Thanks again for the opportunity to comment on the Draft Recreational Hunt Plan and we look forward to continuing to work with you in the future in order to protect and manage all wildlife species and their associated habitats so that future generations may enjoy them. Please feel free to give us a call if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Sam Chappellear", written in a cursive style.

Sam Chappellear
Regional Wildlife Biologist
Region 4

cc: Emily Cope
Tim Ivey

CONTACT—Craig Sasser, Refuge Manager, (843) 527-8069

United States Department of the Interior – Fish and Wildlife Service

Waccamaw National Wildlife Refuge, 21424 North Fraser Street, South Carolina, SC 29440

U.S. Fish & Wildlife Service Seeks Comments on Draft Recreational Hunting Plan and Environmental Assessment for Waccamaw National Wildlife Refuge

A draft Recreational Hunting Plan and Environmental Assessment for Waccamaw National Wildlife Refuge (NWR) in Horry and Georgetown Counties is available for an 18-day public review beginning January 03, 2012. The comment period will end January 20, 2012.

The plan describes two alternatives for hunting on the refuge: (1) the **no action** alternative would allow hunting to remain at the current status and (2) the **proposed action** would open all refuge lands and those lands acquired in the future within the approved acquisition boundary to hunting. Additionally, woodcock hunting will be added on a portion of the refuge. Hunting would be carried out in accordance with Federal and State of South Carolina regulations and refuge-specific regulations.

Copies of the plan can be requested from the refuge and copies are available for review at the following libraries:

Georgetown: 405 Cleland Street, Georgetown

Conway: 801 Main St., Conway

Bucksport: 7657 Highway 701 South, Conway

Copies will also be available at the refuge headquarters and online at <http://www.fws.gov/waccamaw>. Written comments, requests for the plan, or questions can be directed to Craig Sasser, Refuge Manager, at 21424 North Fraser Street, Georgetown, SC 29440; (843) 527-8069. Email comments can be provided to the following address: marshall_sasser@fws.gov

The Waccamaw National Wildlife Refuge is located along the Great Pee Dee and Waccamaw Rivers in Horry and Georgetown Counties, South Carolina. Wildlife-dependant recreation is available to the public including fishing, wildlife observation, photography, and environmental education.

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 94 million-acre National Wildlife Refuge System which encompasses more than 542 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 70 national fish hatcheries, 64 fishery resource offices and 78 ecological services field stations. The agency enforces Federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

BROWNS FERRY HOLDS NEW YEAR'S PARADE



KELLY FULLER/TIMES

and adults participated in the Browns Ferry parade on Saturday. The parade, which is a tradition in Browns Ferry, included classic cars, numerous trucks, decorated vehicles and golf carts to welcome in the new year.

POUNDED

GE 1A

was found not guilty of the charge but was convicted by a jury of conspiracy to commit murder and sentenced to five years in prison, which he is currently serving. After the trial, the name of the man was evoked as the person responsible for Pope's

testimony to the South Carolina Attorney General's Office, as well as to the authorities, retired attorney John H. Sasser describes a polygraph test administered to 28-year-old Keith in September 2004.

He told investigators he overheard — also known as "Debo" — another man he had killed in a fight, according to court documents. As asked, while hooked up to a lie detector machine, if he had indeed overheard the claim. He "yes."

A miner reported to police no one was noted when Keith gave

testimony from prosecution and punishment under the very same laws that they bountifully hand down upon their unsuspecting targets."

Loushonda Myers — the sister-in-law of Dameron Myers — states in the petition the bad blood between law enforcement and her family began in 1995 when police responded to a call of a dog fight on Merriman Road.

Two of Dameron's brothers — Tyre and Jamol — as well as numerous other people, were standing on the corner.

Jamol had their dog on a leash right beside him.

"Without asking for permission, an officer approached the dog and attempted to inspect it. Consequently, the dog bit the officer in the leg. The officer sustained a large wound to the leg," Loushonda Myers states in the petition. "Right afterwards, an officer approached and punched Tyre. Tyre began fighting with the officer. Then several of the officer's comrades pounced on Tyre and started beating him. So, his brother, Jamol, ran to his aid and began fighting the officers that were attacking his brother."

Both of the Myers brothers were arrested and were charged with sever-

al petition states, adding his wife, Yvonne Myers, pleaded with the officers to obtain the appropriate help for her husband.

"They ignored her requests and allowed his condition to further degenerate," states the letter. "The local jail could not handle him, and they refused to obtain the proper medical treatment for him."

Jim Hodges, the governor at the time, issued an order mandating Myers be sent to the Department of Corrections for safekeeping, although he had not been convicted of a crime.

The transfer to Lee Correctional Facility was allegedly done without informing Yvonne Myers her husband was being moved.

When it was determined the proper care could not be given at Lee, Myers was transferred to Kirkland Correctional Institute.

Loushonda Myers says Marvin Myers Sr. should have been taken to a mental health facility rather than a prison.

"Once she had located her husband, Yvonne made several attempts to visit him. She was constantly denied visits to him because the staff kept telling her

Waccamaw refuge seeks public comment, holds open house

Waccamaw National Wildlife Refuge is seeking public comments on a hunting plan.

Staff there will hold an open house on Jan. 18 from 5 to 7 p.m. to review the documents that outline the plan.

This is updated information from a previous announcement.

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A draft Recreational Hunting Management Plan and Environmental Assessment for Waccamaw National Wildlife Refuge (NWR) in Horry, Georgetown and Marion counties is available for public review beginning Tuesday, Jan. 3 and ending Jan. 20.

An open house will be held at the Refuge Visitor Center at 21424 N. Fraser St., Georgetown, SC 29440 on Wednesday, Jan. 18 from 5 p.m. to 7 p.m. to review each document.

The plan describes two alternatives for hunting on the refuge:

(1) the no action alternative would allow hunting to remain at the current status and

(2) the proposed action would open all refuge lands and those lands acquired in the future within the approved acquisition boundary to hunting.

Additionally, woodcock hunting will be added on a portion of the Refuge. Hunting would be carried out in accordance with Federal and State of South Carolina regulations and Refuge-specific regulations.

Copies of the plan are available at the Refuge Visitor Center, online at www.fws.gov/waccamaw, and are also available for review at the following libraries:

Georgetown: 405 Cleland Street, Georgetown

Conway: 801 Main St., Conway

Bucksport: 7657 Highway 701 South, Conway

Written comments, requests for the plan, or questions can be directed to Craig Sasser, Refuge Manager, at 21424 North Fraser Street, Georgetown, SC 29440; (843) 527-8069.

Comments must be submitted to one of the following addresses: Email: marshall.sasser@fws.gov or Mail: 21424 N. Fraser St., Georgetown, SC 29440.

◆ ◆ ◆

The Waccamaw National Wildlife Refuge is located along the Great Pee Dee and Waccamaw Rivers in Horry and Georgetown counties, South Carolina. Wildlife-dependent recreation is available to the public including fishing, wildlife observation, photography and environmental education.

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 94 million-acre National Wildlife Refuge System which encompasses more than 542 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 70 national fish hatcheries, 64 fishery resource offices and 78 ecological services field stations.

The agency enforces Federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts.

It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

For Immediate Release:

CONTACT—Craig Sasser, Refuge Manager, (843) 527-8069

United States Department of the Interior – U.S. Fish and Wildlife Service

Waccamaw National Wildlife Refuge, 21424 North Fraser Street, South Carolina, SC 29440

U.S. Fish & Wildlife Service Seeks Comments on the Compatibility Determination Document for the 2012 Recreational Hunting Plan for Waccamaw National Wildlife Refuge

A Compatibility Determination has been developed for the 2012 Recreational Hunting Plan for Waccamaw National Wildlife Refuge (NWR) in Horry and Georgetown Counties and is available for a 30-day public review beginning January 30, 2012. The comment period will end February 29th, 2012.

The 2012 Recreational Hunting Plan describes two alternatives for hunting on the Refuge: (1) the **no action** alternative would allow hunting to remain at the current status and (2) the **proposed action** would open all Refuge lands and those lands acquired in the future within the approved acquisition boundary to hunting. Additionally, woodcock hunting will be added on a portion of the Refuge. Hunting would be carried out in accordance with Federal and State of South Carolina regulations and Refuge-specific regulations.

Copies will be available at the Refuge headquarters and online at <http://www.fws.gov/waccamaw>. Written comments, requests for the plan, or questions can be directed to Craig Sasser, Refuge Manager, at 21424 North Fraser Street, Georgetown, SC 29440; (843) 527-8069. Email comments can be provided to the following address: marshall_sasser@fws.gov

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The comment period will end Feb. 29.

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The State Capitol Report

SUBMITTED BY

REP. CARL ANDERSON

SC House District #103

The legislative session continued last week, with several bills being passed out of the House and several new measures introduced by our Members.

Here are some highlights for the week:

Strengthening the Inspector General's Office

S.258: An Act was ratified that would improve the function of the Inspector General's Office, and to improve accountability for the appointee to the office.

Campaign Finance Reform

A couple of named bills, H.4669, the "SC Clean Elections Act," as well as H.4660, the "SC Campaign Finance Reform Act of 2012" were introduced. Another bill, H.4670 was introduced that would enact a measure to provide for public financing of elections under certain circumstances.

Ethics Reform

Several bills were introduced concerning ethics reform. H.4672 would further restrict eligibility to run for elective office to exclude felons even after pardoning or time lapse. Another bill, H.4673, was introduced that would require enhanced reporting for public

Improving Vital Statistics Records

H.4687: A bill was introduced to require electronic filing and transmission of death certificates among all parties required to complete the certificate, and to define "electronic signature."

Helping Young Service Members Travel

H.4663: A bill that requires car rental companies to offer their services to members of the military over the age of eighteen who would otherwise be able to rent vehicles but for restrictions based on age.

Protecting Children from Lung Cancer

A bill, H.4644, was introduced that would make it unlawful for a driver to smoke a tobacco product while a child of preschool age is also an occupant of the vehicle.

Fighting the Scourge of Bullying

A bill, H.4645, was introduced that would require school districts to have a Student Bullying Advisory Council to address the issue of student bullying and other related issues.

Remembering Our History

The House adopted and sent to the Senate a bill, H.4635, which would memorialize the US Congress to designate a National Heritage Area in South Carolina due to the significance of South

Coming through

Conway's Trevon Long tries to beat a pair of Sumter defenders to the basket during a Region VI-A AAAA duel this past Friday night at CHS. The Tigers trailed by 15 points entering the fourth quarter, but pulled within a pair of baskets in the final minute before coming up just short.

ROBERT ANDERSON | THE HORRY INDEPENDENT



Refuge seeks comment on hunting proposal

A compatibility determination has been developed for the 2012 Recreational Hunting Plan for Waccamaw National Wildlife Refuge (NWR) in Horry and Georgetown counties and is available for a 30-day public review ending Feb. 29. The 2012 Recreational Hunting Plan describes two alternatives for hunting on the Refuge: (1) the no action alternative would allow hunting to remain at the current status and (2) the proposed action would open all Refuge lands and those lands acquired in the future within the approved acquisition boundary to hunting.

Additionally, woodcock hunting will be added on a portion of the Refuge. Hunting would be carried out in accordance with Federal and State of South Carolina regulations and Refuge-specific regulations.

Copies will be available at the Refuge headquar-

ters and online at www.fws.gov/waccamaw. Written comments, requests for the plan, or questions can be directed to Craig Sasser, refuge manager, at 21424 North Fraser St., Georgetown, SC 29440; 527-8069. Email comments can be sent to marshall_sasser@fws.gov.

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